

LAMP-TR-008
CFAR-TR-853
CS-TR-3775

March 1997

Document Understanding - 1996

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Abstract

This report contains nearly 340 references which are directly related to the field of document image understanding and appeared in major journals and conferences during 1996. Each reference is classified by major topic. Areas covered include, but are not limited to, preprocessing, models and representations, on-line recognition, off-line recognition, graphics recognition and interpretation, page processing, post-processing and special applications.

***The support of the LAMP Technical Report Series and the partial support of this research by the National Science Foundation under grant EIA0130422 and the Department of Defense under contract MDA9049-C6-1250 is gratefully acknowledged.

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAR 1997		2. REPORT TYPE		3. DATES COVERED 00-03-1997 to 00-03-1997	
4. TITLE AND SUBTITLE Document Understanding - 1996				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Language and Media Processing Laboratory, Institute for Advanced Computer Studies, University of Maryland, College Park, MD, 20742-3275				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 48	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

DOCBIB
Document Understanding Bibliography



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March 28, 1997

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1 Introduction

This document contains information about **DOCBIB**, a Document Understanding Bibliography which has been available on-line from the University of Maryland since the Fall of 1993.

The complete bibliography contains selected references from before 1980, major references for the 1980's and a more complete set of references for 1990 and beyond. References are included for topics such as preprocessing, representation, on- and off-line recognition, graphics interpretation, page analysis, and signature verification, among others.

The bibliography is not intended to be comprehensive of all document understanding literature, but rather is a resource which can be used to obtain entry points into the document literature. The current bibliography is skewed toward document image understanding, with some on-line recognition references. The bibliography is updated periodically as new sources emerge or as additional topics are added by interested parties.

This report contains only entries for the calendar year 1996; additional entries for previous years are available online. Each entry appears only once in its major category. Although a given category may be blank, there may be relevant entries listed in other categories. Users are encouraged to make use of the on-line search capabilities to obtain a more comprehensive list.

SPECIAL NOTE: In the online version of this document, many of the categories have changed and several were added for 1996. Unfortunately, they have not yet filtered back through previous years. For example, Word Segmentation, Enhancement, and Retrieval were added, but references from previous years may still fall in other categories. The category classification is not intended to be comprehensive, but rather representative. The best way to search the literature is on-line.

1.1 Sources

References have been gathered from a wide variety of sources, but are primarily from the computer vision and pattern recognition literature. The next two sections contain lists of primarily conference and journal sources, respectively.

1.1.1 Conference and Workshop Proceedings

<i>Abbreviation</i>	<i>Conference</i>	<i>Years</i>
CVPR	IEEE Computer Society Conference on Computer Vision and Pattern Recognition	1985-
DAS	Document Analysis Systems	
GREC	International Workshop on Graphics Recognition	
ICIP	International Conference on Image Processing	
ICPR	International Conference on Pattern Recognition	1984-
ICDAR	International Conference on Document Analysis and Recognition	1991-
IWFHR	International Workshop on Frontiers in Handwriting Recognition	1990-
SDIUT	Symposium on Document Image Understanding Technology	
SPIE	SPIE - Character Recognition and Document Analysis Meetings	
SSPR	Syntactic and Structural Pattern Recognition	
VF	Visual Form	

1.1.2 Journals

<i>Abbreviation</i>	<i>Journal</i>	<i>Years</i>
AI	Artificial Intelligence	1987
BC	Biological Cybernetics	1990-
CGIP	Computer Graphics and Image Processing	
COMPUTER	IEEE Computer	
CVGIP	Computer Vision, Graphics and Image Processing	1984-
CVIP	Computer Vision and Image Processing	1992-
CVIU	Computer Vision and Image Understanding	
GMIP	Graphical Models and Image Processing (CVGIP)	1992-
IBMJRD	IBM Journal of Research and Development	
IBMSYS	IBM Systems Journal	
IJCV	International Journal of Computer Vision	
IJPRAI	International Journal of Pattern Recognition and Artificial Intelligence	
IPL	Information Processing Letters	
IU	Image Understanding (CVGIP)	1992-
IVC	Image and Vision Computing	
JVCIR	Journal of Visual Communication and Image Representation	
MVA	Machine Vision and Applications	
PIEEE	Proceedings of the IEEE	
PR	Pattern Recognition	1983-
PRL	Pattern Recognition Letters	1983-
SP	Signal Processing	
TCOMP	IEEE Transactions on Computers	
TIP	IEEE Transactions on Image Processing	
TPAMI	IEEE Transactions on Pattern Analysis and Machine Intelligence	
TSMC	IEEE Transactions on Systems, Man, and Cybernetics	
TSE	IEEE Transactions on Software Engineering	
VC	The Visual Computer	

1.2 Organization of Bibliography

This bibliography is stored in BibTEX format, with all of the standard fields and an additional “CATEGORY” field which contains a broad categorization of the article into the hierarchy presented below.

Not all references fit cleanly into a single category. The hardcopy version of the bibliography places each reference into the *most appropriate* primary category¹. Secondary keywords are appended to provide a more specific categorization of the topic described or the approach taken in the work.

Please note:

- As a general rule, a topic or category area will be given its own section when it contains 10 references which do not fit cleanly into another category.
- No hyphans are used in any of the keywords.
- The category “GENERAL” is used as a way of extracting references other then the ones in the other subsections.

1.2.1 Hierarchy

		<u>CATEGORY</u>
I Books	1	[BOOK,*]
II Meetings	2	[MEETING,*]
III Special Issues	3	[SPECIAL ISSUE,*]
IV Pre-processing Tasks		
Survey	4	[PREPROCESSING,SURVEY]
Character Segmentation	5	[PREPROCESSING,CHARACTER SEGMENTATION]
Word Segmentation	6	[PREPROCESSING,WORD SEGMENTATION]
Feature Extraction	7	[PREPROCESSING,FEATURE EXTRACTION]
Skew Detection	8	[PREPROCESSING,SKEW]
Text/Graphics Discrimination	9	[PREPROCESSING,TEXT GRAPHICS]
Thinning	10	[PREPROCESSING,THINNING]
Thresholding	11	[PREPROCESSING,THRESHOLDING]
Vectorization	12	[PREPROCESSING,VECTORIZATION]
Enhancement	13	[PREPROCESSING,ENHANCEMENT]
General References	14	[PREPROCESSING,*]
V Models, Analysis and Representations		
Models of Documents	15	[DOCUMENT MODELS]
Handwriting Models	16	[HANDWRITING MODELS]
Handwriting Analysis	17	[HANDWRITING ANALYSIS]
Representations	18	[REPRESENTATION]
VI Text Processing		
On-line Recognition		
Surveys	19	[TEXT PROCESSING,ONLINE,SURVEY]
Foreign	20	[TEXT PROCESSING,ONLINE,FOREIGN LANGUAGE]
Gestures and Sketches	21	[TEXT PROCESSING,ONLINE,SKETCHES]
Script	22	[TEXT PROCESSING,ONLINE,HANDWRITTEN]
Word Recognition	23	[TEXT PROCESSING,ONLINE,WORD]
General References	24	[TEXT PROCESSING,ONLINE,*]
Optical Character Recognition - Latin		
Surveys	25	[TEXT PROCESSING,OCR,SURVEY]
Hand-Printed	26	[TEXT PROCESSING,OCR,HAND PRINTED]
Script	27	[TEXT PROCESSING,OCR,HANDWRITTEN]
Machine-Printed	28	[TEXT PROCESSING,OCR,MACHINE PRINTED]
Digit Recognition	29	[TEXT PROCESSING,OCR,DIGIT]
Word Recognition	30	[TEXT PROCESSING,OCR,WORD]
General References	31	[TEXT PROCESSING,OCR,*]
Optical Character Recognition - Foreign		
Chinese	32	[TEXT PROCESSING,OCR,FOREIGN LANGUAGE,CHINESE]
Japanese	33	[TEXT PROCESSING,OCR,FOREIGN LANGUAGE,JAPANESE]

¹ On-line access to DocBib is described in Section 1.5.2

Hebrew	34	[TEXT PROCESSING,OCR,FOREIGN LANGUAGE,HEBREW]
Arabic	35	[TEXT PROCESSING,OCR,FOREIGN LANGUAGE,ARABIC]
Other Languages	36	[TEXT PROCESSING,OCR,FOREIGN LANGUAGE,*]
General References	37	[TEXT PROCESSING,*]
VII Graphics Recognition and Interpretation		
Surveys	38	[GRAPHICS,SURVEY]
Engineering Drawings	39	[GRAPHICS,ENGINEERING DRAWING]
Mathematics and Formulas	40	[GRAPHICS,FORMULAS]
Maps	41	[GRAPHICS,MAPS]
Tables	42	[GRAPHICS,TABLES]
Sketches	43	[GRAPHICS,SKETCHES]
Line Drawings and Diagrams	44	[GRAPHICS,LINE DRAWING]
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VIII Page and Document Processing		
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Page Classification	48	[DOCUMENT PROCESSING, CLASSIFICATION, PAGE]
Page Structure Analysis		
Page Segmentation	49	[DOCUMENT PROCESSING,PAGE SEGMENTATION]
Logical Layout Analysis	50	[DOCUMENT PROCESSING,LOGICAL ANALYSIS]
General References	51	[DOCUMENT PROCESSING,PAGE SEGMENTATION,LOGICAL ANALYSIS]
Systems	52	[DOCUMENT PROCESSING,SYSTEM]
General References	53	[DOCUMENT PROCESSING,*]
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Evaluation	55	[POSTPROCESSING,EVALUATION]
General References	56	[POSTPROCESSING,*]
X Special Applications		
Check Processing	57	[APPLICATION,CHECKS]
Fax Processing	58	[APPLICATION,FAX]
Forms Processing	59	[APPLICATION,FORMS]
Character Set Recognition	60	[APPLICATION,CHARACTER SET RECOGNITION]
Language Recognition	61	[APPLICATION,LANGUAGE RECOGNITION]
Logo Recognition	62	[APPLICATION,LOGO]
Postal Applications	63	[APPLICATION,POSTAL]
Signature Verification	64	[APPLICATION,SIGNATURE]
Writer Identification	65	[APPLICATION,WRITER IDENTIFICATION]
Document Image Retrieval	66	[APPLICATION,RETRIEVAL]
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Halftoning	71	[HALFTONING]
Font Processing	72	[FONT]
Synthetic Data	73	[SYNTHETIC]
Databases	74	[DATABASES]
Music Recognition	75	[MUSIC]
Shorthand	76	[SHORTHAND]
Natural Scenes	77	[NATURE]
Information Retrieval	78	[INFORMATION RETRIEVAL]
Machine Translation	79	[MACHINE TRANSLATION]
Hardware	80	[HARDWARE]
XII Miscellaneous	81	[MISC]

1.2.2 Primary Category Descriptors

BOOK	Book
MEETING	Meeting
SPECIAL ISSUE	Special Issue
APPLICATIONS	
CHARACTER SEGMENTATION	
CHARACTER SET RECOGNITION	Alphabet Identification
CHECKS	Check Processing
COMPRESSION	
CONTEXT	Use of Context or Priors
DATABASES	for Training, Testing or Storage
DIGITAL LIBRARIES	
DOCUMENT MODELS	Page Level Modeling
DOCUMENT PROCESSING	
ENGINEERING DRAWING	Engineering Drawing Interpretation
ENHANCEMENT	
EVALUATION	Error Analysis and Evaluation
FAX	Fax Processing
FEATURE EXTRACTION	Feature Extraction
FOREIGN LANGUAGE	Foreign Language Processing
FORMS	Forms Processing
FORMULAS	Mathematics and Scientific Notation
GENERAL	General References of a Category
GRAPHICS	Graphics Understanding
HAND PRINTED	Hand-Produced Documents
HANDWRITING ANALYSIS	Handwriting Analysis
HANDWRITING MODELS	
HANDWRITTEN	Handwritten (Script) Recognition
HUMAN INTERACTION	
INFORMATION RETRIEVAL	
LANGUAGE RECOGNITION	
LINE DRAWING	
LOGICAL ANALYSIS	Logical Layout Analysis
LOGO	Logo and Seal Processing
MACHINE PRINTED	Machine-produced Documents
MACHINE TRANSLATION	
MAPS	Map Understanding
MUSIC	Music Processing
NATURE	Documents in 3D Scenes
NATURE LANGUAGE	Documents in 3D Scenes
OCR	Optical Character Recognition
ONLINE	On-line Recognition
PAGE CLASSIFICATION	
PAGE SEGMENTATION	
POSTAL	Mail-piece Processing
POSTPROCESSING	
PREPROCESSING	
RETRIEVAL	Retrieval of Document Images
REPRESENTATION	

SHORTHAND	Shorthand Processing
SIGNATURE	Signature Verification
SKETCHES	Hand-produced Graphics
SKEW	Skew Detection and Correction
SPECIAL APPLICATIONS	
SURVEY	Survey Papers
SYNTHETIC	
TABLES	Table Processing, Flowcharts
TEXT PROCESSING	
TEXT GRAPHICS	Text/Graphics Discrimination
THINNING	Thinning Algorithms
THRESHOLDING	Thresholding Algorithms
WORD	Whole Word Recognition
WORD SEGMENTATION	
WRITER IDENTIFICATION	
ZONE CLASSIFICATION	

1.2.3 Additional Category Descriptors

General Descriptors

ADDRESS	Address Block Location
COLOR	Processing of Color in Documents
COMPRESSION	Compression and Vectorization
DIGIT	Numeric Digits
FONT	Font Processing
GRAYSCALE	
HARDWARE	Hardware
HOUGH	Hough Transform
MARKOV	Markov Models
MORPHOLOGY	
NGRAM	N-Gram Probabilities
OFFLINE	
PARALLEL	Parallel Algorithms
SYSTEM	Systems
VECTORIZATION	
ZIP CODE	Zip Code Processing

Classifier/Pattern Recognition Descriptors

CLASSIFIER	Classification
CLUSTERING	Clustering Approach
FUZZY LOGIC	
KNOWLEDGE BASED	Expert Systems
LEARNING	Learning-based Approaches
NEURAL NET	Neural Nets
RELAXATION	Relaxation
STATISTICAL	Statistical PR Approaches
STRUCTURAL	Structural Approaches
SYNTACTIC	Syntactic PR Approaches
TEMPLATE MATCHING	

Language Descriptors

ARABIC	
CHINESE	
CHITRA	
CYRILLIC	
DEVANAGARI	
FARSI	
GREEK	
HEBREW	
ITALIAN	
JAPANESE	KANJI
JAPANESE	HIRAGANA
JAPANESE	KATAKANA
KOREAN	
MANDARIN	
PINYIN	
TAMIL	
TELUGU	

1.3 BIBTEX Conventions

- The bibtex-key is constructed by using the author's last name and the last two digits of the year. For multiple references by the same author or authors with the same first three letters of the last name, the letters 'a', 'b', ... are appended.

```
@inproceedings{kasturi88,
  AUTHOR = {R. Kasturi},
  BOOKTITLE = ICPR,
  PAGES = {255-259 },
  TITLE = {A System for Recognition and Description of Graphics },
  YEAR = 1988,
  CATEGORY = {DOC, TEXTGRAPH}
}

@article{kasturi88a,
  AUTHOR = {R. Kasturi and J. Alemany },
  JOURNAL = TSE,
  PAGES = {671-675},
  TITLE = {Information Extraction from Images of Paper-Based Maps },
  VOLUME = 14,
  YEAR = 1988,
  CATEGORY = {GRAPHICS, MAPS}
}
```

- All @STRING commands are kept in one file (DocumentStrings.bib). This file should be the first file in bibliography command.

1.4 Bibliography File

The bibliographies are provided in a compiled Postscript version organized by category, with contents, and an author index, and well as in a searchable database.

doc89.ps: contains the compiled reference list in a Postscript File

The 1990-present bibliographies are yearly.

A comprehensive bibliography is also available (.PS), but may differ slightly from older yearly collections because of changes in the organization.

1.5 Accessing DOCBIB

1.5.1 Off-Line

A copy of this document is available by sending a request to the Language and Media Processing Laboratory, Center for Automation Research, University of Maryland, College Park, MD 20742.

1.5.2 On-Line from the Document Information Server

Via WWW access

A search form is available via WWW at <http://documents.cfar.umd.edu>

Via anonymous FTP access

To access files in DOCBIB, internet users can use FTP (file-transfer-protocol) to copy files and programs to their machines. The bibliographies can be downloaded and searched using the *bibindex* and *biblook* utilities provided in the utilities directory from documents.cfar.umd.edu. See the file named README for more information about the contents of files.

In the following example, where much of the output from ftp is left out, the following conventions are used.

"\$" is your system's prompt

"ftp>" is the prompt from the file transfer program

\$ ftp documents.cfar.umd.edu	to reach our archive; obscure text will follow
Name (...): anonymous	user logs in with standard anon ftp name
Password: yourname@yoursite	use your name and your site for identification
ftp> cd pub/DOCBIB	go to DOC Bibliography directory
ftp> dir	to get a listing of what's there
ftp> get README	to retrieve a file
ftp> cd databases	go to DOC Bibliography Database directory
ftp> get DocumentBib.ps	to retrieve the complete PS file
ftp> quit	to leave ftp when done

1.6 Acknowledgements

We thank Professor Azriel Rosenfeld for the tens of thousands of vision references he has compiled over the years, of which document understanding is a small part. He has graciously allowed us to use the data and convert it for inclusion in our system.

Special thanks to Chris Vance for his many hours of editing references and writing utilities to automate the creation process and to Kevin Marsh for subsequent updates.

2 Books

- [1] R. Kasturi and K. Tombre, editors. *Graphics Recognition – Methods and Applications*. Springer, Berlin, Germany, 1996.
KEY: kasturi96
CATEGORIES: BOOK

3 Meetings

- [2] Workshop on Document Analysis Systems. Malvern, PA, USA, 10/14–16 1996.
KEY: das96
CATEGORIES: MEETING
- [3] Fourth French National Conference on Writing and Documents. Nantes, France, 7/3–5 1996.
KEY: fncwd96
CATEGORIES: MEETING
- [4] Fifth International Workshop on Frontiers in Handwriting Recognition. Colchester, UK, 9/2–5 1996.
KEY: iwflhr96
CATEGORIES: MEETING
- [5] Fifth Symposium on Document Analysis and Information Retrieval. Las Vegas, NV, USA, 4/15–17 1996.
KEY: sdair96
CATEGORIES: MEETING
- [6] SPIE - Document Recognition III. San Jose, CA, USA, 1/29–30 1996.
KEY: spie2660
CATEGORIES: MEETING

4 Special Issues

- [7] B. Schatz and H. Chen, editors. *Building Large-Scale Digital Libraries*, volume 29 of *IEEE Computer*. January, 1996.
KEY: computersi96
CATEGORIES: SPECIAL ISSUE
- [8] S.N. Srihari and D. Niyogi, editors. *Document Analysis and Recognition*, volume 7 of *IJIST*. Winter, 1996.
KEY: ijistsi96
CATEGORIES: SPECIAL ISSUE
- [9] S. Mori, editor. *Character Recognition and Document Understanding*, volume E79-D of *T-IFS*. May, 1996.
KEY: tissi96
CATEGORIES: SPECIAL ISSUE
- [10] S.S. Chen, editor. *Digital Libraries: Guest Editor's Introduction*, volume 7 of *VCIR*. March, 1996.
KEY: vcirsi96
CATEGORIES: SPECIAL ISSUE

5 Pre-processing Tasks

5.1 Survey

- [11] R. G. Casey and E. Lecolinet. A survey of methods and strategies in character segmentation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(7):690–706, 1996.

KEY: casey96

CATEGORIES: PREPROCESSING, SURVEY, CHARACTER SEGMENTATION

- [12] Y. Lu and M. Shridhar. Character segmentation in handwritten words—an overview. *Pattern Recognition*, 29(1):77–96, 1996.

KEY: lu96

CATEGORIES: PREPROCESSING, SURVEY, CHARACTER SEGMENTATION, TEXT PROCESSING, OCR, HANDWRITTEN

- [13] D. Trier, A. K. Jain, and T. Taxt. Feature extraction methods for character recognition—a survey. *Pattern Recognition*, 29(4):641–662, 1996.

KEY: trier96

CATEGORIES: PREPROCESSING, SURVEY, FEATURE EXTRACTION

5.2 Character Segmentation

- [14] S. W. Lee and E. J. Lee. Integrated segmentation and recognition of connected handwritten characters with recurrent neural network. In *Proceedings of the SPIE - Document Recognition III*, pages 251–261, 1996.

KEY: lee96d

CATEGORIES: PREPROCESSING, CHARACTER SEGMENTATION, NEURAL NET

- [15] A. Ymin and Y. Aoki. On the segmentation of multi-font printed Uygur scripts. In *Proceedings of the International Conference on Pattern Recognition*, pages 215–219, 1996.

KEY: min96

CATEGORIES: PREPROCESSING, CHARACTER SEGMENTATION, TEXT PROCESSING, OCR, FOREIGN LANGUAGE

- [16] M. Okamoto, H. Yamamoto, K. Sawada, and K. Yamamoto. On-line handwriting character string separation method using network expression. In *Proceedings of the International Conference on Pattern Recognition*, pages 422–425, 1996.

KEY: okamoto96

CATEGORIES: PREPROCESSING, CHARACTER SEGMENTATION

5.3 Word Segmentation

- [17] S. W. Lee, D. J. Lee, and H. S. Park. A new methodology for gray-scale character segmentation and recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(10):1045–1050, 1996.

KEY: lee96c

CATEGORIES: PREPROCESSING, WORD SEGMENTATION, TEXT PROCESSING, OCR, GENERAL, GREY, CHARACTER SEGMENTATION

- [18] C. Oliver, H. Miled, K. Romeo, and Y. Lecourtier. Segmentation and coding of Arabic handwritten words. In *Proceedings of the International Conference on Pattern Recognition*, pages 264–268, 1996.

KEY: oliver96

CATEGORIES: PREPROCESSING, WORD SEGMENTATION, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, ARABIC

5.4 Feature Extraction

- [19] R. R. Bailey and M. Srinath. Orthogonal moment features for use with parametric and non-parametric classifiers. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(4):389–499, 1996.

KEY: bailey96

CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, GENERAL, CLASSIFIER

- [20] J.H. Chiang and P. Gader. A hybrid feature extraction framework for handwritten numeric fields recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 436–440,

1996.
KEY: chiang96a
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, DIGIT, MACHINE PRINTED
- [21] P. D. Gader and M. A. Khabou. Automatic feature generation for handwritten digit recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(12):1256–1261, 1996.
KEY: gader96a
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, DIGIT, HANDWRITTEN
- [22] G.E. Kopec and M. Lomelin. Document-specific character template estimation. In *Proceedings of the SPIE - Document Recognition III*, pages 14–26, 1996.
KEY: kopec96a
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION
- [23] J. R. Lin and C. F. Chen. Stroke extraction for Chinese characters using a trend-followed transcribing technique. *Pattern Recognition*, 29(11):1789–1806, 1996.
KEY: lin96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE
- [24] G. Nagy and X. Wang. Automatically-generated high-reliability features for dichotomies of printed characters. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 247–254, 1996.
KEY: nagy96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION
- [25] G. Nagy and Y. Xu. Priming the recognizer. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 263–281, 1996.
KEY: nagy96a
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, GENERAL
- [26] H. Nishida. Shape recognition by integrating structural descriptions and geometrical/statistical transforms. *Computer Vision and Image Understanding*, 63(1):248–262, 1996.
KEY: nishida96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, STRUCTURAL
- [27] G. Sirkantan, S. W. Lam, and S. N. Srihari. Gradient-based contour encoding for character recognition. *Pattern Recognition*, 29(7):1147–1160, 1996.
KEY: sirkantan96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, GENERAL
- [28] K. Toraichi, T. Kumamoto, K. Yamamoto, and H. Yamada. Feature analysis of handprinted Chinese characters. *Pattern Recognition Letters*, 17(7):795–800, 1996.
KEY: toraichi96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE
- [29] X. Wang and T. Tsutsumida. A new method of character line extraction from mixed-unformatted documents. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: wang96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION
- [30] D. S. Yeung and H. S. Fong. A fuzzy substroke extractor for handwritten Chinese characters. *Pattern Recognition*, 29(12):1963–1980, 1996.
KEY: yeung96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, HANDWRITTEN

- [31] M. Zhang, C.Y. Suen, and T. D. Bui. Feature extraction in character recognition with associative memory classifier. *International Journal of Pattern Recognition and Artificial Intelligence*, 10(3):325–348, 1996.
KEY: zhang96
CATEGORIES: PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, GENERAL, HARDWARE, CLASSIFIER

5.5 Skew Detection

- [32] H.F. Jiang, C.C. Han, and K.C. Fan. A fast approach to detect and correct skew documents. In *Proceedings of the International Conference on Pattern Recognition*, pages 742–746, 1996.
KEY: jiang96
CATEGORIES: PREPROCESSING, SKEW
- [33] Y. Min, S.B. Cho, and Y. Lee. A data reduction method for efficient document skew estimation based on Hough transformation. In *Proceedings of the International Conference on Pattern Recognition*, pages 732–736, 1996.
KEY: min96a
CATEGORIES: PREPROCESSING, SKEW
- [34] U. Pal and B. B. Chaudhuri. An improved document skew angle estimation technique. *Pattern Recognition Letters*, 17(8):899–904, 1996.
KEY: pal96
CATEGORIES: PREPROCESSING, SKEW
- [35] K. Takizawa, D. Arita, M. Minoh, and K. Ikeda. Extraction of inclined character strings from unformed document images using the confidence value. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 839–845, 1996.
KEY: takizawa96
CATEGORIES: PREPROCESSING, SKEW
- [36] B. Yu and A. K. Jain. A robust and fast skew detection algorithm for generic documents. *Pattern Recognition*, 29(10):1599–1630, 1996.
KEY: yu96
CATEGORIES: PREPROCESSING, SKEW

5.6 Text/Graphics Discrimination

- [37] L. H. Chen, J. Y. Wang, H. Y. Liao, and K. C. Fan. A robust algorithm for separation of Chinese characters from line drawings. *Image and Vision Computing*, 14(10):761–762, 1996.
KEY: chen96c
CATEGORIES: PREPROCESSING, TEXT GRAPHICS, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, LINE DRAWING
- [38] D. Dunn, T. Weldon, and W. Higgins. Extracting halftones from printed documents using texture analysis. In *Proceedings of the International Conference on Image Processing*, pages 225–228, 1996.
KEY: dunn96
CATEGORIES: PREPROCESSING, TEXT GRAPHICS
- [39] S. He and N. Abe. A clustering-based approach to the separation of text strings from mixed text/graphics documents. In *Proceedings of the International Conference on Pattern Recognition*, pages 706–710, 1996.
KEY: he96
CATEGORIES: PREPROCESSING, TEXT GRAPHICS

5.7 Thinning

- [40] Y.S. Chen. The use of hidden deletable pixel detection to obtain bias-reduced skeletons in parallel thinning. In *Proceedings of the International Conference on Pattern Recognition*, pages 91–95, 1996.

KEY: chen96h

CATEGORIES: PREPROCESSING, THINNING

- [41] H.P. Chiu and D.C. Tseng. A feature-preserved thinning algorithm for handwritten Chinese characters. In *Proceedings of the International Conference on Pattern Recognition*, pages 235–239, 1996.

KEY: chiu96

CATEGORIES: PREPROCESSING, THINNING, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE

- [42] Y.Y. Zhang and P.S.P. Wang. A parallel thinning algorithm with two-subiteration that generates one-pixel-wide skeletons. In *Proceedings of the International Conference on Pattern Recognition*, pages 457–461, 1996.

KEY: zhang96a

CATEGORIES: PREPROCESSING, THINNING, PARALLEL

5.8 Thresholding

5.9 Vectorization

- [43] Y. Chen, N. A. Langrana, and A. K. Das. Perfecting vectorized mechanical drawings. *Computer Vision and Image Understanding*, 63(1):273–286, 1996.

KEY: chen96b

CATEGORIES: PREPROCESSING, VECTORIZATION, DRAWING

- [44] A. N. Kolesuikov, V. V. Belekhev, and I. O. Chalenko. Vectorization of raster images. *Pattern Recognition and Image Analysis*, 6(4):786–794, 1996.

KEY: kolesuikov96

CATEGORIES: PREPROCESSING, VECTORIZATION

- [45] W. Liu and D. Dori. Sparse pixel tracking: A fast vectorization algorithm applied to engineering drawings. In *Proceedings of the International Conference on Pattern Recognition*, pages 808–812, 1996.

KEY: liu96c

CATEGORIES: PREPROCESSING, VECTORIZATION, GRAPHICS, ENGINEERING DRAWING

5.10 Enhancement

- [46] M.B.H. Ali. Background noise detection and cleaning in document images. In *Proceedings of the International Conference on Pattern Recognition*, pages 758–762, 1996.

KEY: ali96

CATEGORIES: PREPROCESSING, ENHANCEMENT

- [47] Y. Chung, K. Lee, J. Paik, and Y. Lee. Extraction and restoration of digits touching or overlapping lines. In *Proceedings of the International Conference on Pattern Recognition*, pages 155–159, 1996.

KEY: chung96

CATEGORIES: PREPROCESSING, ENHANCEMENT

- [48] J. D. Hobby and H. S. Baird. Degraded character image restoration. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 233–246, 1996.

KEY: hobby96

CATEGORIES: PREPROCESSING, ENHANCEMENT

- [49] M.Y. Jaisimha, E. A. Riskin, and R. Ladner. Model-based restoration of document images for OCR. In *Proceedings of the SPIE - Document Recognition III*, pages 297–308, 1996.

KEY: jaisimha96a

CATEGORIES: PREPROCESSING, ENHANCEMENT, OCR

- [50] J. Liang, R.M. Haralick, and I. T. Phillips. Document image restoration using binary morphological filters. In *Proceedings of the SPIE - Document Recognition III*, pages 274–285, 1996.

KEY: liang96a

CATEGORIES: PREPROCESSING, ENHANCEMENT

- [51] G. McLean. Geometric correction of digitized art. *CVGIP: Graphical Models and Image Processing*, 58(2):142–154, 1996.

KEY: mclean96

CATEGORIES: PREPROCESSING, ENHANCEMENT, GRAPHICS, TABLES

- [52] K. Nakashima, M. Koga, K. Marukawa, Y. Shima, and Y. Nakano. A high speed contour fill method for character image generation. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 832–838, 1996.

KEY: nakashima96

CATEGORIES: PREPROCESSING, ENHANCEMENT, GENERAL

- [53] P. Parodi and G. Piccoli. An efficient pre-processing of mixed-content document images for OCR systems. In *Proceedings of the International Conference on Pattern Recognition*, pages 778–782, 1996.

KEY: parodi96

CATEGORIES: PREPROCESSING, ENHANCEMENT

- [54] T. Pavlidis. Document de-blurring using maximum likelihood methods. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 63–75, 1996.

KEY: pavlidis96

CATEGORIES: PREPROCESSING, ENHANCEMENT

- [55] S. J. Shellhammer, D. P. Goren, and T. Pavlidis. Selective sampling and edge enhancement in bar code laser scanning. In *Proceedings of the SPIE - Document Recognition III*, pages 354–366, 1996.

KEY: shellhammer96

CATEGORIES: PREPROCESSING, ENHANCEMENT, BARCODE

- [56] A. P. Whichello and H. Yan. Linking broken character borders with variable sized masks to improve recognition. *Pattern Recognition*, 29(8):1429, 1996.

KEY: whichello96

CATEGORIES: PREPROCESSING, ENHANCEMENT, FEATURE EXTRACTION

5.11 General References

- [57] Z. Chen, C.W. Lee, and R.H. Cheng. Handwritten Chinese character analysis and preclassification using stroke structural sequence. In *Proceedings of the International Conference on Pattern Recognition*, pages 89–93, 1996.

KEY: chen96i

CATEGORIES: PREPROCESSING, GENERAL, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE

- [58] S. Iliescu, R. Shinghal, and R.Y.M. Teo. Proposed heuristic procedures to preprocess character patterns using line adjacency graphs. *Pattern Recognition*, 29(6):951–976, 1996.

KEY: iliescu96

CATEGORIES: PREPROCESSING, GENERAL, TEXT PROCESSING, OCR, GENERAL

- [59] R. Plamondon and W. Guerfali. Why handwriting segmentation can be misleading? In *Proceedings of the International Conference on Pattern Recognition*, pages 396–400, 1996.

KEY: plamondon96

CATEGORIES: PREPROCESSING, GENERAL, TEXT PROCESSING

- [60] S. Di Zenzo, L. Cinque, and S. Levialdi. Run-based algorithms for binary image analysis and processing. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(1):83–88, 1996.

KEY: zenzo96

CATEGORIES: PREPROCESSING, GENERAL

6 Models, Analysis and Representations

6.1 Models of Documents

- [61] H. Nishida. Automatic construction of structural models incorporating discontinuous transformations. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(4):400–411, 1996.
KEY: nishida96a
CATEGORIES: DOCUMENT MODELS, PREPROCESSING, FEATURE EXTRACTION, TEXT PROCESSING, OCR, GENERAL, STRUCTURAL
- [62] H. Nishida. Analysis and synthesis of deformed patterns based on structural models. In *Proceedings of the International Conference on Pattern Recognition*, pages 315–319, 1996.
KEY: nishida96b
CATEGORIES: DOCUMENT MODELS, PREPROCESSING, FEATURE EXTRACTION

6.2 Handwriting Models

6.3 Handwriting Analysis

- [63] S. Jager. Recovering writing traces in off-line handwriting recognition: Using a global optimization technique. In *Proceedings of the International Conference on Pattern Recognition*, pages 150–154, 1996.
KEY: jager96a
CATEGORIES: HANDWRITING ANALYSIS

6.4 Representations

- [64] A. P. Lenaghan and R. Malyan. Cognitive and artificial representations in handwriting recognition. In *Proceedings of the SPIE - Document Recognition III*, pages 206–213, 1996.
KEY: lenaghan96
CATEGORIES: REPRESENTATION, TEXT PROCESSING, OCR, HANDWRITTEN

7 Text Processing

7.1 On-line Recognition

7.1.1 Surveys

7.1.2 Foreign

- [65] J.W. Chen and S.Y. Lee. On-line handwriting recognition of Chinese characters via a rule-based approach. In *Proceedings of the International Conference on Pattern Recognition*, pages 220–224, 1996.
KEY: chen96j
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, OCR, CHINESE
- [66] K.S. Chou, K.C. Fan, and T.I. Fan. Radical-based neighboring segment matching method for on-line Chinese character recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 84–88, 1996.
KEY: chou96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, OCR, CHINESE
- [67] M. Hamanaka, K. Yamada, and J. Tsukumo. On-line Japanese character recognition based on flexible pattern matching method using normalization-cooperative feature extraction. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 825–831, 1996.
KEY: hamanaka96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, JAPANESE, FEATURE EXTRACTION

- [68] H. J. Kim and P. K. Kim. On-line recognition of cursive Korean characters using a set of extended primitive strokes and fuzzy functions. *Pattern Recognition Letters*, 17(1):19–28, 1996.
KEY: kim96b
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, KOREAN
- [69] H.J. Kim, J.W. Jung, and S.K. Kim. On-line Chinese character recognition using art-based stroke classification. *Pattern Recognition Letters*, 17(12):1311, 1996.
KEY: kim96c
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, CHINESE
- [70] K. Kiyota, S. Yamamoto, N. Ezaki, and T. Sakurai. On-line Japanese character recognition system for visually disabled persons. In *Proceedings of the International Conference on Pattern Recognition*, pages 210–214, 1996.
KEY: kiyota96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, OCR, JAPANESE
- [71] S. R. Lay, C. H. Lee, N. J. Cheng, C. C. Tseng, B. S. Jeng, P. Y. Ting, Q. Z. Wu, and M. L. Day. On-line Chinese character recognition with effective candidate radical and candidate character selections. *Pattern Recognition*, 29(10):1647–1658, 1996.
KEY: lay96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, CHINESE
- [72] J. Liu, W.K. Cham, and M.Y. Chang. Stroke order and stroke number free on-line Chinese character recognition using attributed relational graph matching. In *Proceedings of the International Conference on Pattern Recognition*, pages 259–263, 1996.
KEY: liu96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, OCR, CHINESE
- [73] M. Nakagawa and L.V. Tu. Structural learning of character patterns for on-line recognition of handwritten Japanese characters. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: nakagawa96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, JAPANESE, LEARNING
- [74] M. Nakagawa, K. Akiyama, L.V. Tu, A. Homana, and T. Higashiyama. Robust and highly customizable recognition of on-line handwritten Japanese characters. In *Proceedings of the International Conference on Pattern Recognition*, pages 269–273, 1996.
KEY: nakagawa96a
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, OCR, JAPANESE
- [75] K. Toyokawa, K. Kitamura, S. Katoh, H. Kaneko, and N. Itoh. An approach to integrated pen interface for Japanese text entry. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 817–824, 1996.
KEY: toyokawa96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, JAPANESE
- [76] Y. H. Tseng and H. J. Lee. A knowledge-based structural Chinese handwriting recognition system. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: tseng96a
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, CHINESE, STRUCTURAL
- [77] T. Wakahara, N. Nakajima, S. Miyahara, and K. Odaka. On-line cursive kanji character recognition using stroke-based affine transformation. In *Proceedings of the International Conference on Pattern Recognition*, pages 204–209, 1996.
KEY: wakahara96
CATEGORIES: TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, OCR, JAPANESE

7.1.3 Gestures and Sketches

7.1.4 Script

- [78] J. Hu, M.K. Brown, and W. Turin. HMM based on-line handwriting recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(10):1039–1044, 1996.
KEY: hu96
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN, MARKOV
- [79] J. Hu and M.K. Brown. On-line handwriting recognition with constrained n -best decoding. In *Proceedings of the International Conference on Pattern Recognition*, pages 23–27, 1996.
KEY: hu96b
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN
- [80] A. Malaviya and R. Klette. A fuzzy syntactic method for on-line handwriting recognition. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: malaviya96
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN, SYNTACTIC
- [81] K. Nathan, J. Subrahmonia, and M. Perrone. Parameter tying in writer-dependent recognition of on-line handwriting. In *Proceedings of the International Conference on Pattern Recognition*, pages 28–32, 1996.
KEY: nathan96
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN
- [82] I. Pavlidis, R. Singh, and N.P. Papanikolopoulos. Recognition of on-line handwritten patterns through shape metamorphosis. In *Proceedings of the International Conference on Pattern Recognition*, pages 18–22, 1996.
KEY: pavlidis96a
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN
- [83] H. Schwenk and M. Milgram. Constraint tangent distance for on-line character recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 520–524, 1996.
KEY: schwenk96
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN
- [84] G. Wilfong, F. Sinden, and L. Ruedisueli. On-line recognition of handwritten symbols. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(9):935–940, 1996.
KEY: wilfong96
CATEGORIES: TEXT PROCESSING, ONLINE, HANDWRITTEN

7.1.5 Word Recognition

- [85] L. Duneau and B. Dorizzi. On-line cursive script recognition: a user-adaptive system for word identification. *Pattern Recognition*, 29(12):1981–1994, 1996.
KEY: duneau96
CATEGORIES: TEXT PROCESSING, ONLINE, WORD, HANDWRITTEN
- [86] S. Garcia-Salicetti, B. Dorizzi, P. Gallinari, and Z. Wimmer. Adaptive discrimination in an HMM-based neural predictive system for on-line word recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 515–519, 1996.
KEY: salicetti96
CATEGORIES: TEXT PROCESSING, ONLINE, WORD
- [87] G. Seni. Large vocabulary recognition of on-line handwritten cursive words. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(7):757–762, 1996.
KEY: seni96a
CATEGORIES: TEXT PROCESSING, ONLINE, WORD, HANDWRITTEN

7.1.6 General References

- [88] M.E. Munich and P. Perona. Visual input for pen-based computers. In *Proceedings of the International Conference on Pattern Recognition*, pages 33–37, 1996.

KEY: munich96

CATEGORIES: TEXT PROCESSING, ONLINE, GENERAL, HANDWRITTEN

- [89] M. Munich and P. Perona. Visual input for pen-based computers. In *Proceedings of the International Conference on Image Processing*, pages 173–176, 1996.

KEY: munich96a

CATEGORIES: TEXT PROCESSING, ONLINE, GENERAL

7.2 Optical Character Recognition - Latin

7.2.1 Surveys

- [90] T. Pavlidis. Challenges in document recognition: Bottom up and down processes. In *Proceedings of the International Conference on Pattern Recognition*, pages 500–504, 1996.

KEY: pavlidis96b

CATEGORIES: TEXT PROCESSING, OCR, SURVEY

- [91] J. Schurmann. Text recognition – from pixels to meaning. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 17–36, 1996.

KEY: schurmann96

CATEGORIES: TEXT PROCESSING, OCR, SURVEY

7.2.2 Hand-Printed

- [92] C. Y. Liou and H. C. Yang. Handprinted character recognition based on spatial topology distance measurement. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(9):941–944, 1996.

KEY: liou96

CATEGORIES: TEXT PROCESSING, OCR, HAND PRINTED

- [93] Y. Mizukami and K. Koga. A handwritten character recognition system using hierarchical displacement extraction algorithm. In *Proceedings of the International Conference on Pattern Recognition*, pages 160–164, 1996.

KEY: mizukami96

CATEGORIES: TEXT PROCESSING, OCR, HAND PRINTED, HANDWRITTEN

- [94] H. S. Park and S. W. Lee. Off-line recognition of large-set handwritten characters with multiple hidden Markov models. *Pattern Recognition*, 29(2):231–244, 1996.

KEY: park96

CATEGORIES: TEXT PROCESSING, OCR, HAND PRINTED, MARKOV

- [95] H.S. Park and S.W. Lee. An HMMRF-based statistical approach for off-line handwritten character recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 320–324, 1996.

KEY: park96a

CATEGORIES: TEXT PROCESSING, OCR, HAND PRINTED

7.2.3 Script

- [96] I. S. I. Abuhaiba, M. J. J. Holt, and S. Datta. Processing of binary images of handwritten text documents. *Pattern Recognition*, 29(7):1161–1178, 1996.

KEY: abuhaiba96

CATEGORIES: TEXT PROCESSING, OCR, HANDWRITTEN

- [97] J. Hu and H. Yan. Structural decomposition and description of printed and handwritten characters. In *Proceedings of the International Conference on Pattern Recognition*, pages 230–234, 1996.

KEY: hu96c

CATEGORIES: TEXT PROCESSING, OCR, HANDWRITTEN, PREPROCESSING, FEATURE EXTRACTION

- [98] R. Schwartz, C. LaPre, J. Makhoul, C. Raphael, and Y. Zhao. Language-independent OCR using a continuous speech recognition system. In *Proceedings of the International Conference on Pattern Recognition*, pages 99–103, 1996.
KEY: schwartz96
CATEGORIES: TEXT PROCESSING, OCR, HANDWRITTEN
- [99] R. Seiler, M. Schenkel, and F. Eggimann. Off-line cursive handwriting recognition compared with on-line recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 505–509, 1996.
KEY: seiler96
CATEGORIES: TEXT PROCESSING, OCR, HANDWRITTEN, ONLINE, SURVEY, OFFLINE
- [100] S. Singh. Shape detection using gradient features for handwritten character recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 145–149, 1996.
KEY: singh96
CATEGORIES: TEXT PROCESSING, OCR, HANDWRITTEN

7.2.4 Machine-Printed

- [101] J. M Gomez, O. Lopez, M. Montes, S.A. Bota, J. Juvells, and A. Herms. Implementation and design of a new model of neural network with application to typographical character recognition. In *Proceedings of the International Conference on Image Processing*, pages 201–204, 1996.
KEY: gomez96
CATEGORIES: TEXT PROCESSING, OCR, MACHINE PRINTED, NEURAL
- [102] M.K. Kim and Y.B. Kwon. Multi-size character recognition based on the sampling and quantization of an unwrapped contour. In *Proceedings of the International Conference on Pattern Recognition*, pages 170–174, 1996.
KEY: kim96e
CATEGORIES: TEXT PROCESSING, OCR, MACHINE PRINTED
- [103] G.E. Kopec and M. Lomelin. Document image decoding approach to character template estimation. In *Proceedings of the International Conference on Image Processing*, pages 213–216, 1996.
KEY: kopec96b
CATEGORIES: TEXT PROCESSING, OCR, MACHINE PRINTED

7.2.5 Digit Recognition

- [104] Z. Chi, M. Sueters, and H. Yan. Handwritten digit recognition using combined ID3-derived fuzzy rules and Markov chains. *Pattern Recognition*, 29(11):1821–1834, 1996.
KEY: chi96
CATEGORIES: TEXT PROCESSING, OCR, DIGIT, HAND PRINTED, MARKOV
- [105] S.B. Cho. Recognition of unconstrained handwritten numerals by doubly self-organizing neural network. In *Proceedings of the International Conference on Pattern Recognition*, pages 426–430, 1996.
KEY: cho96
CATEGORIES: TEXT PROCESSING, OCR, DIGIT
- [106] J. T. Favata and G. Srikantan. A multiple feature/resolution approach to handprinted digit and character recognition. *International Journal on Imaging Systems and Technology*, 7(4):304–311, 1996.
KEY: favata96
CATEGORIES: TEXT PROCESSING, OCR, DIGIT, HAND PRINTED
- [107] Y. Hamamoto, S. Uchimura, M. Watanabe, T. Yasuda, and S. Tomita. Recognition of handwritten numerals using Gabor features. In *Proceedings of the International Conference on Pattern Recognition*, pages 250–253, 1996.
KEY: hamamoto96
CATEGORIES: TEXT PROCESSING, OCR, DIGIT, HANDWRITTEN

- [108] T. Kawatani, H. Shimizu, and M. McEachern. Handwritten numeral recognition with the improved LDA method. In *Proceedings of the International Conference on Pattern Recognition*, pages 441–446, 1996.
KEY: kawatani96
CATEGORIES: TEXT PROCESSING, OCR, DIGIT, MACHINE PRINTED
- [109] S. W. Lee. Off-line recognition of totally unconstrained handwritten numerals using multilayer cluster neural network. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(6):648–652, 1996.
KEY: lee96b
CATEGORIES: TEXT PROCESSING, OCR, DIGIT, HANDWRITTEN, NEURAL, NEURAL NET
- [110] M. Revow, C. K. I. Williams, and G. E. Hinton. Using generative models for handwritten digit recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(6):592–606, 1996.
KEY: revow96
CATEGORIES: TEXT PROCESSING, OCR, DIGIT, HANDWRITTEN

7.2.6 Word Recognition

- [111] P. D. Gader, M. A. Mohamed, and J. M. Keller. Fusion of handwritten word classifiers. *Pattern Recognition Letters*, 17(6):577–584, 1996.
KEY: gader96
CATEGORIES: TEXT PROCESSING, OCR, WORD, CLASSIFIER
- [112] P. D. Gader and M. A. Mohamed. Choquet fuzzy integral in handwritten word recognition. In *Proceedings of the SPIE - Document Recognition III*, pages 309–320, 1996.
KEY: gader96b
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN
- [113] V. Govindaraju and R. K. Krishnamurthy. Holistic handwritten word recognition using temporal features derived from off-line images. *Pattern Recognition Letters*, 17(5):537–540, 1996.
KEY: govindaraju96
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN
- [114] G. Kim and V. Govindaraju. Efficient chain-code-based image manipulation for handwritten word recognition. In *Proceedings of the SPIE - Document Recognition III*, pages 262–273, 1996.
KEY: kim96d
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN
- [115] G. Kim, V. Govindaraju, and S.N. Srihari. A segmentation and recognition strategy for handwritten phrases. In *Proceedings of the International Conference on Pattern Recognition*, pages 510–514, 1996.
KEY: kim96f
CATEGORIES: TEXT PROCESSING, OCR, WORD
- [116] F. Kimura, S. Tsuruoka, Y. Miyake, and M. Shridhar. A lexicon directed algorithm for recognition of unconstrained handwritten words. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 785–793, 1996.
KEY: kimura96
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN
- [117] S. W. Lee, C. H. Kim, H. Ma, and Y. Y. Tang. Multiresolution recognition of unconstrained handwritten numerals with wavelet transform and multilayer cluster neural network. *Pattern Recognition*, 29(12):1953–1962, 1996.
KEY: lee96
CATEGORIES: TEXT PROCESSING, OCR, WORD, NEURAL NET
- [118] S. Madhvanath and V. Govindaraju. Holistic lexicon reduction for handwritten word recognition. In *Proceedings of the SPIE - Document Recognition III*, pages 224–234, 1996.
KEY: madhvanath96a
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN

- [119] M. Mohamed and P. Gader. Handwritten word recognition using segmentation-free hidden Markov modeling and segmentation-based dynamic programming techniques. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(5):548–553, 1996.
KEY: mohaned96
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN, MARKOV
- [120] C. Parisse. Global word shape processing in off-line recognition of handwriting. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(4):460–464, 1996.
KEY: parisse96
CATEGORIES: TEXT PROCESSING, OCR, WORD, HANDWRITTEN

7.2.7 General References

- [121] H. Drucker. Fast decision tree ensembles for optical character recognition. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 137–148, 1996.
KEY: drucker96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [122] T.K. Ho. Adaptive coordination of multiple classifiers. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 338–351, 1996.
KEY: ho96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL, CLASSIFIER
- [123] T. Hong and S. N. Srihari. Unified approach toward text recognition. In *Proceedings of the SPIE - Document Recognition III*, pages 27–36, 1996.
KEY: hong96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [124] T. Jager. OCR and voting shell fulfilling specific text analysis requirements. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 287–302, 1996.
KEY: jager96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [125] D. M. Jung. N-tuple features for OCR revisited. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(7):734–745, 1996.
KEY: jung96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [126] Z.M. Kovacs-V. A system for reading low quality characters from printouts. In *Proceedings of the International Conference on Pattern Recognition*, pages 185–189, 1996.
KEY: kovacs96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [127] M. Kudo, K. Mizukami, Y. Nakamura, and M. Shimbo. Realization of membership queries in character recognition. *Pattern Recognition Letters*, 17(1):77–82, 1996.
KEY: kudo96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [128] J. H. Lim, H. H. Teh, H. C. Lui, and P.Z. Wang. Stochastic topology with elastic matching for off-line handwritten character recognition. *Pattern Recognition Letters*, 17(2):149–154, 1996.
KEY: lim96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL, HANDWRITTEN
- [129] J. Makhou, R. Schwartz, C. LaPre, C. Raphael, and I. Bazzi. Language-independent and segmentation-free techniques for optical character recognition. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 99–116, 1996.
KEY: makhou96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [130] A. Navarro and C.R. Allen. Towards a writer-dependent hand-written character recogniser. In *Proceedings of the International Conference on Image Processing*, pages 189–192, 1996.
KEY: navarro96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL, APPLICATION, WRITER IDENTIFICATION

- [131] H. Sakano, H. Kida, and N. Mukawa. Seeing the character images that an OCR system sees — Analysis by genetic algorithm. In *Proceedings of the International Conference on Pattern Recognition*, pages 411–416, 1996.
KEY: sakano96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [132] H. Shi and T. Pavlidis. A system for text recognition based on graph embedding matching. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 415–430, 1996.
KEY: shi96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [133] Y.Y. Tang, B.F. Li, H. Ma, J. Liu, C.H. Lueng, and C.Y. Suen. A novel approach to optical character recognition based on ring- projection-wavelet-fractal signatures. In *Proceedings of the International Conference on Pattern Recognition*, pages 325–329, 1996.
KEY: tang96a
CATEGORIES: TEXT PROCESSING, OCR, GENERAL
- [134] S. Wang, X. Zhu, and Y. Jin. Multiple experts recognition system based on neural network. In *Proceedings of the International Conference on Pattern Recognition*, pages 452–456, 1996.
KEY: wang96b
CATEGORIES: TEXT PROCESSING, OCR, GENERAL, NEURAL
- [135] C. L. Wilson, P. J. Grother, and C. S. Barnes. Binary decision clustering for neural-network-based optical character recognition. *Pattern Recognition*, 29(3):425–438, 1996.
KEY: wilson96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL, MARKOV, CLUSTERING
- [136] K. Yamada. Adaptive processing parameter adjustment by feedback recognition method with inverse recall neural network model. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 794–800, 1996.
KEY: yamada96
CATEGORIES: TEXT PROCESSING, OCR, GENERAL, NEURAL, NEURAL NET

7.3 Optical Character Recognition - Foreign

7.3.1 Chinese

- [137] A. Amin, M. Bemford, A. Hoffmann, and A. Mahidadia. Recognition of hand-printed Chinese characters using ripple down rules. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: amin96a
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, HANDWRITTEN
- [138] A. Amin, M. Bemford, A. Hoffmann, A. Mahidadia, and P. Compton. A knowledge acquisition technique for recognizing handprinted Chinese characters. In *Proceedings of the International Conference on Pattern Recognition*, pages 254–258, 1996.
KEY: amin96b
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE
- [139] C. H. Chang. Simulated annealing clustering of Chinese words for contextual text recognition. *Pattern Recognition Letters*, 17(1):57–66, 1996.
KEY: chang96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, WORD
- [140] L. Chen and Y. K. Lee. A new approach for recognizing multifont Chinese characters used in a special application. *International Journal of Pattern Recognition and Artificial Intelligence*, 10(3):203–222, 1996.
KEY: chen96a
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE

- [141] A. J. Hsieh, K. C. Fan, and T. I. Fan. Handwritten Chinese character recognition by greedy matching with geometry constraint. *Image and Vision Computing*, 14(2):91–104, 1996.
KEY: hsieh96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, HANDWRIT-
TEN
- [142] T. Shioyama and J. Hamanaka. Recognition algorithm for handprinted Chinese characters by 2D-FFT. In *Proceedings of the International Conference on Pattern Recognition*, pages 225–229, 1996.
KEY: shioyama96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, HAND PRINTED
- [143] D. C. Tseng, H. P. Chiu, and J. C. Cheng. Invariant handwritten Chinese character recognition using fuzzy ring data. *Image and Vision Computing*, 14(9):647–658, 1996.
KEY: tseng96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE, HANDWRIT-
TEN
- [144] D.C. Tseng and H.P. Chiu. Fuzzy ring data for invariant handwritten Chinese character recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 94–98, 1996.
KEY: tseng96b
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE
- [145] A.B. Wang, K.C. Fan, and W.H. Wu. A recursive hierarchical scheme for radical extraction of handwritten Chinese characters. In *Proceedings of the International Conference on Pattern Recognition*, pages 240–244, 1996.
KEY: wang96a
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE

7.3.2 Japanese

- [146] T. Hong, G. Srikantan, V.C. Zandy, C. Fang, and S. N. Srihari. Character recognition in a Japanese text recognition system. In *Proceedings of the SPIE - Document Recognition III*, pages 51–62, 1996.
KEY: hong96a
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE
- [147] T. Hong, S. Wu, and S. N. Srihari. Evaluating Japanese document recognition in the internet/intranet environment. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 633–650, 1996.
KEY: hong96b
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE
- [148] K. Muraki. Error correction scheme augmented with statistical and lexical learning capability, for Japanese OCR. In *Proceedings of the International Conference on Pattern Recognition*, pages 560–564, 1996.
KEY: muraki96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE
- [149] J. Rocha and H. Fujisawa. Substructure shape analysis for Kanji character recognition. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: rocha96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE, KANJI
- [150] M. Sawaki and N. Hagita. Character recognition of Japanese newspaper headlines with graphical designs. In *Proceedings of the SPIE - Document Recognition III*, pages 175–183, 1996.
KEY: sawaki96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE
- [151] S. N. Srihari, G. Srikantan, T. Hong, and B. Grom. A general-purpose Japanese optical character recognition system. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 271–286, 1996.
KEY: srihari96b
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE

- [152] M. Yoshimura, T. Shimizu, and I. Yoshimura. A recognition system for Japanese zip code using arc features. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 810–816, 1996.
KEY: yoshimura96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE, APPLICATION, POSTAL, ZIP CODE

7.3.3 Hebrew

7.3.4 Arabic

- [153] A. Amin, H. Al-Sadoun, and S. Fischer. Hand-printed Arabic character recognition system using an artificial network. *Pattern Recognition*, 29(4):663–676, 1996.
KEY: amin96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, ARABIC, HANDWRITTEN
- [154] E.J. Erlandson, J.M. Trenkle, and R. C. Vogt. Word-level recognition of multifont Arabic text using a feature vector matching approach. In *Proceedings of the SPIE - Document Recognition III*, pages 63–71, 1996.
KEY: erlandson96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, ARABIC, MACHINE PRINTED

7.3.5 Other Languages

- [155] H. J. Kim and P. K. Kim. Recognition of off-line handwritten Korean characters. *Pattern Recognition*, 29(3):245–254, 1996.
KEY: kim96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, KOREAN, HANDWRITTEN
- [156] W. S. Kim and R. H. Park. Off-line recognition of handwritten Korean and alphanumeric characters using hidden markov models. *Pattern Recognition*, 29(5):845–838, 1996.
KEY: kim96a
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, KOREAN, MARKOV, HANDWRITTEN
- [157] J.S. Lee, O.J. Kwon, and S.Y. Bang. Highly accurate recognition of printed Korean characters through an improved grapheme recognition method. In *Proceedings of the International Conference on Pattern Recognition*, pages 447–451, 1996.
KEY: lee96g
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, KOREAN
- [158] B. Timsari and H. Fahimi. Morphological approach to character recognition in machine-printed Persian words. In *Proceedings of the SPIE - Document Recognition III*, pages 184–191, 1996.
KEY: timsari96
CATEGORIES: TEXT PROCESSING, OCR, FOREIGN LANGUAGE, PERSIAN

7.4 General References

- [159] K. Aas and L. Eikvil. Text page recognition using grey-level features and hidden Markov models. *Pattern Recognition*, 29(6):977–986, 1996.
KEY: aas96
CATEGORIES: TEXT PROCESSING, GENERAL, GREY, MARKOV
- [160] D. E. Brown, C. L. Pittard, and H. Park. Classification trees with optimal multivariate decision nodes. *Pattern Recognition Letters*, 17(7):699–704, 1996.
KEY: brown96
CATEGORIES: TEXT PROCESSING, GENERAL

- [161] K. P. Chan. Learning templates from fuzzy examples in structural pattern recognition. *IEEE Transactions on Systems, Man and Cybernetics*, 26(1):118–123, 1996.
KEY: chan96
CATEGORIES: TEXT PROCESSING, GENERAL, LEARNING
- [162] H. D. Cheng and D. C. Xia. A novel parallel approach to character recognition and its VLSI implementation. *Pattern Recognition*, 29(1):97–120, 1996.
KEY: cheng96
CATEGORIES: TEXT PROCESSING, GENERAL, HARDWARE, PARALLEL
- [163] V. A. Cheushev, E. G. Kochergov, and D. V. Popel. Verification of the recognized text in document understanding systems. *Pattern Recognition and Image Analysis*, 6(1):536–540, 1996.
KEY: cheushev96
CATEGORIES: TEXT PROCESSING, GENERAL, POSTPROCESSING, EVALUATION
- [164] L.P. Cordella, P. Foggia, C. Sansone, and M. Vento. An efficient algorithm for the inexact matching of arg graphs using a contextual transformational model. In *Proceedings of the International Conference on Pattern Recognition*, pages 180–184, 1996.
KEY: cordella96
CATEGORIES: TEXT PROCESSING, GENERAL
- [165] S. Senda, M. Minoh, and K. Ikeda. Fast string searching in a character lattice. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, page 846, 1996.
KEY: senda96
CATEGORIES: TEXT PROCESSING, GENERAL

8 Graphics Recognition and Interpretation

8.1 Surveys

8.2 Engineering Drawings

- [166] A. M. Darwish and A. R. Bashandy. Recognition and processing of logic diagrams. In *Proceedings of the SPIE - Document Recognition III*, pages 367–376, 1996.
KEY: darwish96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING, DIAGRAM
- [167] D. Dori and L. Wenjin. Vector-based segmentation of text connected to graphics in engineering drawing. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: dori96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING, PREPROCESSING, TEXT GRAPHICS
- [168] J. Gao, X. Li, and Z. Tang. Character recognition in engineering drawings by pattern matching method. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: gao96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [169] M. Katagiri and M. Nagura. Recognition of line shapes using neural networks. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 754–760, 1996.
KEY: katagiri96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING, NEURAL NET
- [170] P. Kokelj. Statistical pattern classification with electric circuits. *Pattern Recognition Letters*, 17(3):251–262, 1996.
KEY: kokelj96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING, STATISTICAL

- [171] B.T. Messmer and H. Bunke. Clustering and error-correcting matching of graphs for learning and recognition of symbols in engineering drawings. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 282–296, 1996.
KEY: messmer96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING, LEARNING
- [172] R. Mullo, J.M. Ogier, F. Brisepierre, Y. Lecourtier, and M.F. Collinas. An original approach for extracting circular shapes from technical charts. In *Proceedings of the International Conference on Pattern Recognition*, pages 813–817, 1996.
KEY: mullo96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [173] G. Priestnall, R. E. Marston, and D. G. Elliman. Arrowhead recognition during automated data capture. *Pattern Recognition Letters*, 17(3):277–286, 1996.
KEY: priestnall96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [174] J.Y. Ramel, N. Vincent, and H. Emptoz. Combining global and local vision for technical document understanding. In *Proceedings of the International Conference on Pattern Recognition*, pages 773–777, 1996.
KEY: ramel96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [175] S. Satoh, H. Mo, and M. Sakauchi. Drawing understanding system incorporating rule generation support with man-machine interactions. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 735–742, 1996.
KEY: satoh96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [176] M. Weiss and D. Dori. Automatic resolution of object features from engineering drawings for 3-D. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: weiss96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [177] L. Wenyn and D. Dori. Automated CAD conversion with the machine drawing understanding system. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 241–262, 1996.
KEY: wenyn96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING
- [178] K. Yamamoto, H. Yamada, and S. Muraki. Recognition of elevation symbols and reconstruction of 3D surface from contours by parallel method. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 749–753, 1996.
KEY: yamamoto96
CATEGORIES: GRAPHICS, ENGINEERING DRAWING, PARALLEL

8.3 Mathematics and Formulas

- [179] R. J. Fateman, T. Tokuyasu, B. P. Berman, and N. Mitchell. Optical character recognition and parsing of typeset mathematics. *Visual Communication and Image Representation*, 7(1):2–17, 1996.
KEY: fateman96
CATEGORIES: GRAPHICS, FORMULAS
- [180] R.J. Fateman and T. Tokuyasu. Progress in recognizing typeset mathematics. In *Proceedings of the SPIE - Document Recognition III*, pages 37–50, 1996.
KEY: fateman96a
CATEGORIES: GRAPHICS, FORMULAS

8.4 Maps

- [181] N. Babaguchi, S. Dan, and T. Kitahashi. Generation of sketch map image and its instructions to support the understanding of geographical information. In *Proceedings of the International Conference on Pattern Recognition*, pages 274–278, 1996.
KEY: babaguchi96
CATEGORIES: GRAPHICS, MAPS
- [182] L.H. Chen, H.Y. Liao, J.Y. Wang, K.C. Fan, and C.C. Hsieh. An interpretation system for cadastral maps. In *Proceedings of the International Conference on Pattern Recognition*, pages 711–715, 1996.
KEY: chen96k
CATEGORIES: GRAPHICS, MAPS
- [183] J. E. den Hartog, T. K. ten Kate, and J. J. Gerbrands. Knowledge-based interpretation of utility maps. *Computer Vision and Image Understanding*, 63(1):105–117, 1996.
KEY: hartog96
CATEGORIES: GRAPHICS, MAPS
- [184] I. Pinto and H. Freeman. The feedback approach to cartographic area text placement. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: pinto96
CATEGORIES: GRAPHICS, MAPS
- [185] E. Reiher, Y. Li, V. Delle Donne, M. Lalonde, C. Hayne, and C. Zhu. A system for efficient and robust map symbol recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 783–787, 1996.
KEY: reiher96
CATEGORIES: GRAPHICS, MAPS
- [186] H. Samet and A. Soffer. MARCO: Map retrieval by cOntent. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(8):783–798, 1996.
KEY: samet96
CATEGORIES: GRAPHICS, MAPS, RETRIEVAL
- [187] D. Trier, T. Taxt, and A.K. Jain. Gray scale processing of hydrographic maps. In *Proceedings of the International Conference on Pattern Recognition*, pages 870–874, 1996.
KEY: trier96a
CATEGORIES: GRAPHICS, MAPS, GREY

8.5 Tables

- [188] J.F. Arias, A. Chhabra, and V. Misra. Efficient interpretation of tabular documents. In *Proceedings of the International Conference on Pattern Recognition*, pages 681–685, 1996.
KEY: arias96a
CATEGORIES: GRAPHICS, TABLES
- [189] S. Chandran, S. Balasubramanian, T. Gandhi, A. Prasad, R. Kasturi, and A. Chhabra. Structure recognition and information extraction from tabular documents. *International Journal on Imaging Systems and Technology*, 7(4):289–303, 1996.
KEY: chandran96
CATEGORIES: GRAPHICS, TABLES
- [190] J. Chen and D. Tseng. Overlapped-character separation and reconstruction for table-form document. In *Proceedings of the International Conference on Image Processing*, pages 233–236, 1996.
KEY: chen96m
CATEGORIES: GRAPHICS, TABLES
- [191] M. A. Rahgozar and R. Cooperman. Graph-based table recognition system. In *Proceedings of the SPIE - Document Recognition III*, pages 192–205, 1996.
KEY: rahgozar96
CATEGORIES: GRAPHICS, TABLES

- [192] T. Watanabe and Q. Luo. A multilayer recognition method for understanding table-form documents. *International Journal on Imaging Systems and Technology*, 7(4):279–288, 1996.
KEY: watanabe96
CATEGORIES: GRAPHICS, TABLES
- [193] T. Watanabe, Q. Luo, and N. Sugie. Knowledge for understanding table-form documents. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 761–769, 1996.
KEY: watanabe96a
CATEGORIES: GRAPHICS, TABLES

8.6 Sketches

- [194] Y. Aoki, A. Shio, H. Arai, and K. Odaka. A prototype system for interpreting hand-sketched floor plans. In *Proceedings of the International Conference on Pattern Recognition*, pages 747–751, 1996.
KEY: aoki96
CATEGORIES: GRAPHICS, SKETCHES
- [195] J. Lladós, J. Lopez-Krahe, and E. Martí. Hand drawn document understanding using the straight line Hough transform and graph matching. In *Proceedings of the International Conference on Pattern Recognition*, pages 497–501, 1996.
KEY: llados96
CATEGORIES: GRAPHICS, SKETCHES, TEXT PROCESSING, GENERAL

8.7 Line Drawings and Diagrams

- [196] O. Hori and S. Tanigawa. Line fitting method for line drawings based on contours and skeletons. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 743–748, 1996.
KEY: hori96
CATEGORIES: GRAPHICS, LINE DRAWING
- [197] J.N. Said, M. Cheriet, and C.Y. Suen. Dynamical morphological processing: A fast method for base line extraction. In *Proceedings of the International Conference on Pattern Recognition*, pages 8–12, 1996.
KEY: said96
CATEGORIES: GRAPHICS, LINE DRAWING

8.8 General References

9 Page and Document Processing

9.1 Surveys

- [198] Y. Y. Tang, S. W. Lee, and C. Y. Suen. Automatic document processing: a survey. *Pattern Recognition*, 29(12):1931–1952, 1996.
KEY: tang96
CATEGORIES: DOCUMENT PROCESSING, SURVEY

9.2 Classification

9.2.1 Zone Classification

- [199] D. Chetverikov, J. Liang, J. Komuves, and R.M. Haralick. Zone classification using texture features. In *Proceedings of the International Conference on Pattern Recognition*, pages 676–680, 1996.
KEY: chetverikov96
CATEGORIES: DOCUMENT PROCESSING, CLASSIFICATION, ZONE

- [200] J. Liang, I.T. Phillips, J. Ha, and R.M. Haralick. Document zone classification using sizes of connected components. In *Proceedings of the SPIE - Document Recognition III*, pages 150–159, 1996.
KEY: liang96
CATEGORIES: DOCUMENT PROCESSING, CLASSIFICATION, ZONE
- [201] F. Y. Shih and S. S. Chen. Adaptive document block segmentation and classification. *IEEE Transactions on Systems, Man and Cybernetics*, 26(5):797–802, 1996.
KEY: shih96
CATEGORIES: DOCUMENT PROCESSING, CLASSIFICATION, ZONE, PAGE SEGMENTATION

9.2.2 Page Classification

- [202] Q. Luo, T. Watanabe, and T. Nakayama. Identifying contents page of documents. In *Proceedings of the International Conference on Pattern Recognition*, pages 696–700, 1996.
KEY: luo96
CATEGORIES: DOCUMENT PROCESSING, CLASSIFICATION, PAGE, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [203] C. Wenzel, S. Baumann, and T. Jager. Advances in document classification by voting of competitive approaches. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 352–374, 1996.
KEY: wenzel96
CATEGORIES: DOCUMENT PROCESSING, CLASSIFICATION, PAGE

9.3 Page Structure Analysis

9.3.1 Page Segmentation

- [204] S. Chen, R. M. Haralick, and I. T. Phillips. Extraction of text lines and text blocks on document images based on statistical modeling. *International Journal on Imaging Systems and Technology*, 7(4):343–356, 1996.
KEY: chen96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, STATISTICAL
- [205] S. Chen, R.M. Haralick, and I.T. Phillips. Extraction of text lines and text blocks on document images based on statistical modeling. In *Proceedings of the SPIE - Document Recognition III*, pages 138–149, 1996.
KEY: chen96f
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, STATISTICAL
- [206] A. P. Dias. Minimum spanning trees for text segmentation. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 51–66, 1996.
KEY: dias96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION
- [207] A. K. Jain and Y. Zhong. Page segmentation using texture analysis. *Pattern Recognition*, 29(5):743–770, 1996.
KEY: jain96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION
- [208] K. Kise, O. Yanagida, and S. Takamatsu. Page segmentation based on thinning of background. In *Proceedings of the International Conference on Pattern Recognition*, pages 788–792, 1996.
KEY: kise96a
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION
- [209] A. Kornai and S.D. Connell. Statistical zone finding. In *Proceedings of the International Conference on Pattern Recognition*, pages 818–822, 1996.
KEY: kornai96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION

- [210] D.X. Le, G.R. Thoma, and H. Wechsler. Automated borders detection and adaptive segmentation for binary document images. In *Proceedings of the International Conference on Pattern Recognition*, pages 737–741, 1996.
KEY: le96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION
- [211] J. Sauvola and M. Pietikainen. A document management interface utilizing page decomposition and content-based compression. In *Proceedings of the International Conference on Pattern Recognition*, pages 752–757, 1996.
KEY: sauvola96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, COMPRESSION
- [212] M. Sawaki and N. Hagita. Text-line extraction and character recognition of Japanese newspaper headlines with graphical designs. In *Proceedings of the International Conference on Pattern Recognition*, pages 73–78, 1996.
KEY: sawaki96a
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION

9.3.2 Logical Layout Analysis

- [213] A. Dengel and F. Dubiel. Computer understanding of document structure. *International Journal on Imaging Systems and Technology*, 7(4):271–278, 1996.
KEY: dengel96
CATEGORIES: DOCUMENT PROCESSING, LOGICAL ANALYSIS
- [214] A. Kam and B. Kopec. Document image decoding by heuristic search. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(9):945–950, 1996.
KEY: kam96
CATEGORIES: DOCUMENT PROCESSING, LOGICAL ANALYSIS
- [215] D. Niyogi and S. N. Srihari. Using domain knowledge to derive the logical structure of documents. In *Proceedings of the SPIE - Document Recognition III*, pages 114–125, 1996.
KEY: niyogi96a
CATEGORIES: DOCUMENT PROCESSING, LOGICAL ANALYSIS
- [216] G.I. Sainz Palmero, J.M. Cano Izquierdo, Y.A. Dimitriadis, and J. Lopez-Coronado. A new neuro-fuzzy system for logical labeling of documents. In *Proceedings of the International Conference on Pattern Recognition*, pages 431–435, 1996.
KEY: palmero96
CATEGORIES: DOCUMENT PROCESSING, LOGICAL ANALYSIS

9.3.3 General References

- [217] F. Bapst, R. Brugger, A. Zramdini, and R. Ingold. Integrated multi-agent architecture for assisted document recognition. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 172–190, 1996.
KEY: bapst96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [218] D. S. Bloomberg. Textured reduction for document image analysis. In *Proceedings of the SPIE - Document Recognition III*, pages 160–174, 1996.
KEY: bloomberg96a
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [219] T. Hu, K. Marukawa, Y. Shima, and H. Fujisawa. A prototype for extracting logical elements from tables of contents of journals. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 388–414, 1996.
KEY: hu96a
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS, TABLES

- [220] J. Liang, J. Ha, R. Rogers, I.T. Phillips, R.M. Haralick, and B. Chanda. The prototype of a complete document image understanding system. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 131–154, 1996.
KEY: liang96b
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [221] J. Liu, Y.Y. Tang, Q. He, and C.Y. Suen. Adaptive document segmentation and geometric relation labeling: Algorithms and experimental results. In *Proceedings of the International Conference on Pattern Recognition*, pages 763–767, 1996.
KEY: liu96a
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [222] D. Niyogi and S. N. Srihari. An integrated approach to document decomposition and structural analysis. *International Journal on Imaging Systems and Technology*, 7(4):330–342, 1996.
KEY: niyogi96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS, STRUCTURAL
- [223] T. Saitoh, T. Yamaai, and M. Tachikawa. Document image segmentation and layout analysis. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 778–784, 1996.
KEY: saito96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [224] S.L. Taylor and M. Lipshutz. Document understanding system for multiple document representations. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 155–171, 1996.
KEY: taylor96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [225] M. Viswanathan, J. Watson, E. Green, and M.S. Krishnamoorthy. Document recognition: An attribute grammar approach. In *Proceedings of the SPIE - Document Recognition III*, pages 101–113, 1996.
KEY: viswanathan96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS
- [226] J. Zhou and D. P. Lopresti. Genetic approach to the analysis of complex text formatting. In *Proceedings of the SPIE - Document Recognition III*, pages 126–137, 1996.
KEY: zhou96
CATEGORIES: DOCUMENT PROCESSING, PAGE SEGMENTATION, LOGICAL ANALYSIS

9.4 Systems

9.5 General References

- [227] K. Kise and N. Babaguchi. Representing, utilizing and acquiring knowledge for document image understanding. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 770–777, 1996.
KEY: kise96
CATEGORIES: DOCUMENT PROCESSING, GENERAL
- [228] S. Mori. Issues in document analysis research and development with historical remarks. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 297–322, 1996.
KEY: mori96
CATEGORIES: DOCUMENT PROCESSING, GENERAL

10 Post-Processing

10.1 Context

- [229] D. Bouchaffra, E. Koontz, V. Kripasundar, and R. K. Srihari. Incorporating diverse information sources in handwriting recognition postprocessing. *International Journal on Imaging Systems and Technology*, 7(4):320–329, 1996.
KEY: bouchaffra96
CATEGORIES: POSTPROCESSING, CONTEXT
- [230] N. Hagita, M. Sawaki, and K. Ishii. Model for selectively increasing learning sample number in character recognition. In *Proceedings of the SPIE - Document Recognition III*, pages 235–242, 1996.
KEY: hagita96
CATEGORIES: POSTPROCESSING, CONTEXT, LEARNING
- [231] R. Hoch and T. Kieninger. On virtual partitioning of large dictionaries for contextual post-processing to improve character recognition. *International Journal of Pattern Recognition and Artificial Intelligence*, 10(3):273–290, 1996.
KEY: hoch96
CATEGORIES: POSTPROCESSING, CONTEXT, TEXT PROCESSING, OCR, GENERAL
- [232] J. J. Hull. Incorporating language syntax in visual text recognition with a statistical model. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(12):1251–1255, 1996.
KEY: hull96a
CATEGORIES: POSTPROCESSING, CONTEXT, STATISTICAL
- [233] S. Messelodi and C. M. Modena. Context driven text segmentation and recognition. *Pattern Recognition Letters*, 17(1):47–56, 1996.
KEY: messelodi96
CATEGORIES: POSTPROCESSING, CONTEXT, TEXT PROCESSING, OCR, GENERAL
- [234] G. Seni, V. Kripasundar, and R. K. Srihari. Generalizing edit distance to incorporate domain information: handwritten text recognition as a case study. *Pattern Recognition*, 29(3):405–414, 1996.
KEY: seni96
CATEGORIES: POSTPROCESSING, CONTEXT, TEXT PROCESSING, OCR, HANDWRITING

10.2 Evaluation

- [235] J.F. Arias, R. Kasturi, and A.K. Chhabra. Evaluating the performance of techniques for the extraction of primitives from line drawings composed of horizontal and vertical lines. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 191–205, 1996.
KEY: arias96
CATEGORIES: POSTPROCESSING, EVALUATION, GRAPHICS, ENGINEERING DRAWING, LINE DRAWING
- [236] A. D. Bagdanov and J. Kanai. Evaluation of document image skew estimation techniques. In *Proceedings of the SPIE - Document Recognition III*, pages 343–353, 1996.
KEY: bagdanov96
CATEGORIES: POSTPROCESSING, EVALUATION, SKEW
- [237] B.B. Chaudhuri and U. Pal. OCR error detection and correction of an inflectional indian language script. In *Proceedings of the International Conference on Pattern Recognition*, pages 245–249, 1996.
KEY: chaudhuri96
CATEGORIES: POSTPROCESSING, EVALUATION, CONTEXT, TEXT PROCESSING, OCR, FOREIGN LANGUAGE
- [238] C.C. Chiang and S.S. Yu. A method for improving the machine recognition of confusing Chinese characters. In *Proceedings of the International Conference on Pattern Recognition*, pages 79–83, 1996.

- KEY: chiang96
CATEGORIES: POSTPROCESSING, EVALUATION
- [239] J. Gonzalez, J. Kanai, and T.A. Nartker. Prediction of OCR accuracy using a neural network. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 323–337, 1996.
KEY: gonzalez96
CATEGORIES: POSTPROCESSING, EVALUATION, TEXT PROCESSING, OCR, GENERAL, NEURAL NET
- [240] V. Govindaraju and S. N. Srihari. Assessment of image quality to predict readability of documents. In *Proceedings of the SPIE - Document Recognition III*, pages 333–342, 1996.
KEY: govindaraju96a
CATEGORIES: POSTPROCESSING, EVALUATION
- [241] J. J. Hull. Performance evaluation for document analysis. *International Journal on Imaging Systems and Technology*, 7(4):357–362, 1996.
KEY: hull96
CATEGORIES: POSTPROCESSING, EVALUATION
- [242] J. Kanai. Automated evaluation of document image analysis systems: Issues and practice. *International Journal on Imaging Systems and Technology*, 7(4):363–369, 1996.
KEY: kanai96
CATEGORIES: POSTPROCESSING, EVALUATION
- [243] S. Latifi. How can permutations be used in the evaluation of zoning algorithms? *International Journal of Pattern Recognition and Artificial Intelligence*, 10(3):223–238, 1996.
KEY: latifi96
CATEGORIES: POSTPROCESSING, EVALUATION, DOCUMENT PROCESSING, PAGE SEGMENTATION
- [244] Y. Li, D. Lopresti, G. Nagy, and A. Tomkins. Validation of image defect models for optical character recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(2):99–108, 1996.
KEY: li96
CATEGORIES: POSTPROCESSING, EVALUATION, SYNTHETIC
- [245] T. Matsui, I. Yamashita, and T. Wakahara. The results of the first IPTP character recognition competition and studies on multi-expert recognition for handwritten numerals. *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, pages 801–809, 1996.
KEY: matsui96
CATEGORIES: POSTPROCESSING, EVALUATION, TEXT PROCESSING, OCR, DIGIT, HANDWRITTEN

10.3 General References

11 Special Applications

11.1 Check Processing

- [246] G. F. Houle, D.B. Aragon, R.W. Smith, M. Shridhar, and D. Kimura. A multi-layered corroboration-based check reader. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 495–546, 1996.
KEY: houle96
CATEGORIES: APPLICATION, CHECKS
- [247] S. Knerr, V. Anisimov, O. Baret, N. Gorski, D. Price, and J. C. Simon. The A2IA recognition system for handwritten checks. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 431–494, 1996.
KEY: knerr96
CATEGORIES: APPLICATION, CHECKS, SYSTEM, HANDWRITTEN

- [248] K. Liu, C.Y. Suen, and C. Nadal. Automatic extraction of items from cheque images for payment recognition. In *Proceedings of the International Conference on Pattern Recognition*, pages 798–802, 1996.
KEY: liu96b
CATEGORIES: APPLICATION, CHECKS
- [249] P. Pereira, L. Heutte, O. Bougeois, J.V. Moreau, B. Plessis, P. Courtellemont, and Y. Lecourtier. Numeral amount recognition on multi-bank checks. In *Proceedings of the International Conference on Pattern Recognition*, pages 165–169, 1996.
KEY: pereira96
CATEGORIES: APPLICATION, CHECKS
- [250] C. Y. Suen, L. Lam, D. Guillevis, N. W. Strathy, M. Cheriet, J. N. Said, and R. Fan. Bank check processing system. *International Journal on Imaging Systems and Technology*, 7(4):392–403, 1996.
KEY: suen96
CATEGORIES: APPLICATION, CHECKS

11.2 Fax Processing

- [251] T. Akiyama. Addressee recognition for automated fax mail distribution. In *Proceedings of the SPIE - Document Recognition III*, pages 214–223, 1996.
KEY: akiyama96
CATEGORIES: APPLICATION, FAX, POSTAL, ADDRESS

11.3 Forms Processing

- [252] J.L. Chen and H.J. Lee. A novel form structure extraction method using strip projection. In *Proceedings of the International Conference on Pattern Recognition*, pages 823–827, 1996.
KEY: chen96l
CATEGORIES: APPLICATION, FORMS
- [253] F. Dubiel and A. Dengel. Formclas - a system for OCR free identification of forms. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 30–62, 1996.
KEY: dubiel96
CATEGORIES: APPLICATION, FORMS, OCR
- [254] M. D. Garriss and D. L. Dimmick. Form design for high accuracy optical character recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(6):653–655, 1996.
KEY: garriss96
CATEGORIES: APPLICATION, FORMS
- [255] M. D. Garriss and P. J. Grother. Generalized form registration using structure-based techniques. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 321–, 1996.
KEY: garriss96a
CATEGORIES: APPLICATION, FORMS
- [256] M. D. Garriss. Intelligent form removal with character stroke preservation. In *Proceedings of the SPIE - Document Recognition III*, pages 321–332, 1996.
KEY: garriss96b
CATEGORIES: APPLICATION, FORMS
- [257] Y. Hirayama. Analyzing form images by using line-shared-adjacent cell relations. In *Proceedings of the International Conference on Pattern Recognition*, pages 768–772, 1996.
KEY: hirayama96
CATEGORIES: APPLICATION, FORMS
- [258] D.A. Kosiba and R. Kasturi. Automatic invoice interpretation: Invoice structure analysis. In *Proceedings of the International Conference on Pattern Recognition*, pages 721–725, 1996.
KEY: kosiba96
CATEGORIES: APPLICATION, FORMS

- [259] B. Latanzio and A. Garzotto. Reliable recognition of handwritten marks in checkboxes. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 311–320, 1996.
KEY: latanzio96
CATEGORIES: APPLICATION, FORMS, HANDWRITTEN
- [260] R.A. Lorie, V.P. Riyaz, and T.K. Truong. A system for automated data entry from forms. In *Proceedings of the International Conference on Pattern Recognition*, pages 686–690, 1996.
KEY: lorie96
CATEGORIES: APPLICATION, FORMS
- [261] S. Madhvanath, V. Govindaraju, and S. N. Srihari. Reading handwritten phrases on U. S. census forms. *International Journal on Imaging Systems and Technology*, 7(4):312–319, 1996.
KEY: madhvanath96
CATEGORIES: APPLICATION, FORMS, HANDWRITTEN
- [262] J. Mao, M. Abayan, and K. Mohiuddin. A model-based form processing sub-system. In *Proceedings of the International Conference on Pattern Recognition*, pages 691–695, 1996.
KEY: mao96
CATEGORIES: APPLICATION, FORMS
- [263] H. U. Mogg-Scheider and C. Augmuth. Information extraction of tax assessment. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 564–580, 1996.
KEY: mogg-scheider96
CATEGORIES: APPLICATION, FORMS
- [264] M. Okada and M. Shridhar. A morphological subtraction scheme for form analysis. In *Proceedings of the International Conference on Pattern Recognition*, pages 190–194, 1996.
KEY: okada96
CATEGORIES: APPLICATION, FORMS
- [265] V. Ramanaprasad, Y. C. Shin, and S. N. Srihari. Reading handprinted addresses on IRS tax forms. In *Proceedings of the SPIE - Document Recognition III*, pages 243–250, 1996.
KEY: ramanaprasad96
CATEGORIES: APPLICATION, FORMS, DOCUMENT PROCESSING, SYSTEM, ADDRESS
- [266] S. Shimotsuji and M. Asano. Form identification based on cell structure. In *Proceedings of the International Conference on Pattern Recognition*, pages 793–797, 1996.
KEY: shimotsuji96
CATEGORIES: APPLICATION, FORMS
- [267] S. N. Srihari, Y.C. Shin, V. Ramanaprasad, and D.S. Lee. A system to read names and addresses on tax forms (invited paper). *Institute of Electronics, Information, and Communications Engineers: Transactions on Information and Systems*, page 1038, 1996.
KEY: srihari96a
CATEGORIES: APPLICATION, FORMS, ADDRESS
- [268] M. Koppen, D. Waldostl, and B. Nickolay. A system for the automated evaluation of invoices. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 1–21, 1996.
KEY: waldostl96
CATEGORIES: APPLICATION, FORMS
- [269] B. Yu and A.K. Jain. A form dropout system. In *Proceedings of the International Conference on Pattern Recognition*, pages 701–705, 1996.
KEY: yu96a
CATEGORIES: APPLICATION, FORMS

11.4 Character Set Recognition

11.5 Language Recognition

- [270] D. Lee, C. Nohl, and H. Baird. Language identification in complex, unoriented, and degraded document images. In *Proceedings of the International Workshop on Document Analysis Systems*,

pages 76–98, 1996.

KEY: lee96e

CATEGORIES: APPLICATION, LANGUAGE RECOGNITION

- [271] P. Sibun and J. C. Reynar. Language identification: Examining the issues. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 125–136, 1996.

KEY: sibun96

CATEGORIES: APPLICATION, LANGUAGE RECOGNITION

- [272] T.N. Tan. Written language recognition based on texture analysis. In *Proceedings of the International Conference on Image Processing*, pages 185–188, 1996.

KEY: tan96

CATEGORIES: APPLICATION, LANGUAGE RECOGNITION

11.6 Logo Recognition

- [273] Y. S. Chen. Automatic identification for a Chinese seal image. *Pattern Recognition*, 29(11):1807–1820, 1996.

KEY: chen96d

CATEGORIES: APPLICATION, LOGO, CHINESE

- [274] D. Doermann, E. Rivlin, and I. Weiss. Applying algebraic and differential invariants for logo recognition. *Machine Vision and Applications*, 9(2):73–86, 1996.

KEY: doermann96

CATEGORIES: APPLICATION, LOGO, INVARIANTS

- [275] R. Haruki, T. Horiuchi, H. Yamada, and K. Yamamoto. Automatic seal verification using three-dimensional reference seals. In *Proceedings of the International Conference on Pattern Recognition*, pages 199–203, 1996.

KEY: haruki96

CATEGORIES: APPLICATION, LOGO

- [276] T. Horiuchi, M. Rioux, R. Haruki, K. Yamamoto, H. Yamada, and K. Toraichi. Three-dimensional approach to thresholding seal impressions. *Pattern Recognition*, 29(5):719–724, 1996.

KEY: horiuchi96

CATEGORIES: APPLICATION, LOGO, THRESHOLDING

- [277] M.Y. Jaisimha. Wavelet features for similarity-based retrieval of logo images. In *Proceedings of the SPIE - Document Recognition III*, pages 89–100, 1996.

KEY: jaisimha96

CATEGORIES: APPLICATION, LOGO, RETRIEVAL

- [278] A. L. Spitz. Logotype detection in compressed images using alignment signatures. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 303–310, 1996.

KEY: spitz96

CATEGORIES: APPLICATION, LOGO, SIGNATURE

11.7 Postal Applications

- [279] T. Bruckner, P. Suda, H. U. Block, and G. Maderlechner. In-house mail distribution by automatic address and content interpretation. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 67–76, 1996.

KEY: bruckner96

CATEGORIES: APPLICATION, POSTAL, DOCUMENT PROCESSING, PAGE SEGMENTATION, ADDRESS

- [280] U. Miletzki. Documents on the move: DA&IR-driven mail piece processing today and tomorrow. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 547–563, 1996.

KEY: miletzki96

CATEGORIES: APPLICATION, POSTAL

- [281] N. Nakajima, T. Tsuchiya, T. Kamimura, and K. Yamada. Analysis of address layout on Japanese handwritten mail: A hierarchical process of hypothesis verification. In *Proceedings of the International Conference on Pattern Recognition*, pages 726–731, 1996.
KEY: nakajima96
CATEGORIES: APPLICATION, POSTAL, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, JAPANESE
- [282] P. W. Palumbo and S. N. Srihari. Postal address reading in real time. *International Journal on Imaging Systems and Technology*, 7(4):370–378, 1996.
KEY: palumbo96
CATEGORIES: APPLICATION, POSTAL, ADDRESS
- [283] S. N. Srihari, Y. C. Shin, V. Ramanaprasad, and Z. Shi. Document image-processing system for name and address recognition. *International Journal on Imaging Systems and Technology*, 7(4):379–391, 1996.
KEY: srihari96
CATEGORIES: APPLICATION, POSTAL, ADDRESS
- [284] A. P. Whichello and H. Yan. Fast location of address blocks and postcodes in mail-piece images. *Pattern Recognition Letters*, 17(11):1199–1214, 1996.
KEY: whichello96a
CATEGORIES: APPLICATION, POSTAL, ADDRESS
- [285] A.P. Whichello and H. Yan. Locating address blocks and postcodes in mail-piece images. In *Proceedings of the International Conference on Pattern Recognition*, pages 716–720, 1996.
KEY: whichello96b
CATEGORIES: APPLICATION, POSTAL

11.8 Signature Verification

- [286] J. P. Drouhard, R. Sabourin, and M. Godbout. A neural network approach to off-line signature verification using directional PDF. *Pattern Recognition*, 29(3):415–424, 1996.
KEY: drouhard96
CATEGORIES: APPLICATION, SIGNATURE
- [287] K. Han and I. K. Sethi. Handwritten signature retrieval and identification. *Pattern Recognition Letters*, 17(1):83–90, 1996.
KEY: han96
CATEGORIES: APPLICATION, SIGNATURE, HANDWRITTEN
- [288] L. L. Lee, T. Berger, and E. Aviczer. Reliable on-line human signature verification systems. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 18(6):643–647, 1996.
KEY: lee96a
CATEGORIES: APPLICATION, SIGNATURE, ONLINE
- [289] L.L. Lee and M.G. Lizrraga. An off-line method for human signature verification. In *Proceedings of the International Conference on Pattern Recognition*, pages 195–198, 1996.
KEY: lee96f
CATEGORIES: APPLICATION, SIGNATURE
- [290] J. Lin and J. Li. Off-line Chinese signature verification. In *Proceedings of the International Conference on Image Processing*, pages 205–208, 1996.
KEY: lin96b
CATEGORIES: APPLICATION, SIGNATURE, TEXT PROCESSING, OCR, FOREIGN LANGUAGE, CHINESE
- [291] R. Martens and L. Claesen. On-line signature verification by dynamic time-warping. In *Proceedings of the International Conference on Pattern Recognition*, pages 38–42, 1996.
KEY: martens96
CATEGORIES: APPLICATION, SIGNATURE

- [292] P. Nassery and K. Faez. Signature pattern recognition using pseudo zernike moments and a fuzzy logic classifier. In *Proceedings of the International Conference on Image Processing*, pages 197–200, 1996.
KEY: nassery96
CATEGORIES: APPLICATION, SIGNATURE
- [293] R. Sabourin, G. Genest, and F. Preteux. Pattern spectrum as a local shape factor for off-line signature verification. In *Proceedings of the International Conference on Pattern Recognition*, pages 43–48, 1996.
KEY: sabourin96
CATEGORIES: APPLICATION, SIGNATURE

11.9 Writer Identification

- [294] E. G. Kochergov and V. A. Cheushev. The development of a decision making procedure for personal identification from handwriting. *Pattern Recognition and Image Analysis*, 6(1):541–544, 1996.
KEY: kochergov96
CATEGORIES: APPLICATION, WRITER IDENTIFICATION

11.10 Document Image Retrieval

- [295] D.S. Bloomberg and F.R. Chen. Document image summarization without OCR. In *Proceedings of the International Conference on Image Processing*, pages 229–232, 1996.
KEY: bloomberg96b
CATEGORIES: APPLICATION, RETRIEVAL
- [296] F. R. Chen and D. S. Bloomberg. Extraction of thematically relevant text from images. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 163–178, 1996.
KEY: chen96e
CATEGORIES: APPLICATION, RETRIEVAL
- [297] I. Dagan, R. Feldman, and H. Hirsh. Keyword-based browsing and analysis of large document sets. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 191–208, 1996.
KEY: dagan96
CATEGORIES: APPLICATION, RETRIEVAL
- [298] D. Doermann, C. Shin, A. Rosenfeld, H. Kauniskangas, J. Sauvola, and M. Pietikainen. The development of a general framework for intelligent document image retrieval. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 605–632, 1996.
KEY: doermann96a
CATEGORIES: APPLICATION, RETRIEVAL
- [299] M. Y. Jaisimha, A. Bruce, and T. Nguyen. Docbrowse: A system for textual and graphical querying on degraded document image data. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 581–604, 1996.
KEY: jaisimha96b
CATEGORIES: APPLICATION, RETRIEVAL
- [300] A. J. Kleiboemer, M. B. Lazear, and J. O. Pedersen. Tailoring a retrieval system for naive users. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 209–216, 1996.
KEY: kleiboemer96
CATEGORIES: APPLICATION, RETRIEVAL
- [301] D. Lopresti and J. Zhou. Retrieval strategies for noisy text. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 255–270, 1996.
KEY: lopresti96
CATEGORIES: APPLICATION, RETRIEVAL

- [302] J.C. O'Neill, A.O. Hero III, and W.J. Williams. Word spotting via spatial point processes. In *Proceedings of the International Conference on Image Processing*, pages 217–220, 1996.
KEY: oneill96
CATEGORIES: APPLICATION, RETRIEVAL
- [303] A. L. Spitz. SPAM: a scientific paper access method. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 117–131, 1996.
KEY: spitz96a
CATEGORIES: APPLICATION, RETRIEVAL
- [304] T.F. Syeda-Mahmood. Indexing of technical line drawing databases. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 206–240, 1996.
KEY: syeda-mahmood96
CATEGORIES: APPLICATION, RETRIEVAL, GRAPHICS, ENGINEERING DRAWING, LINE DRAWING

11.11 Human Interaction

11.12 Digital Libraries

- [305] G.E. Kopec. Document image decoding in the UC Berkeley Digital Library. In *Proceedings of the SPIE - Document Recognition III*, pages 2–13, 1996.
KEY: kopec96
CATEGORIES: APPLICATION, DIGITAL LIBRARIES
- [306] G.E. Kopec. Document image decoding in the Berkeley Digital Library. In *Proceedings of the International Conference on Image Processing*, pages 769–772, 1996.
KEY: kopec96c
CATEGORIES: APPLICATION, DIGITAL LIBRARIES
- [307] D. Lopresti and J. Zhou. Document analysis and the world wide web. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 651–, 1996.
KEY: lopresti96a
CATEGORIES: APPLICATION, DIGITAL LIBRARIES
- [308] T. R. Smith. A digital library for geographically referenced materials. *IEEE Computer*, 29(5):54–60, 1996.
KEY: smith96
CATEGORIES: APPLICATION, DIGITAL LIBRARIES
- [309] E. Vashchenko and V. Pereverzev-Orlov. A program library for an automatic on-line reading system. *Pattern Recognition and Image Analysis*, 6(2):365–366, 1996.
KEY: vashchenko96
CATEGORIES: APPLICATION, DIGITAL LIBRARIES

11.13 General References

- [310] J.F. Cullen and J.J. Hull. Oversized document copying system. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 22–39, 1996.
KEY: cullen96
CATEGORIES: APPLICATION, GENERAL

12 Related Areas

12.1 Compression

- [311] J. Allebach and Q. Lin. FM screen design using DBS algorithm. In *Proceedings of the International Conference on Image Processing*, pages 549–552, 1996.
KEY: allebach96
CATEGORIES: COMPRESSION

- [312] D.S. Bloomberg and F.R. Chen. Extraction of text-related features for condensing image documents. In *Proceedings of the SPIE - Document Recognition III*, pages 72–88, 1996.
KEY: bloomberg96
CATEGORIES: COMPRESSION
- [313] O.E. Kia and D.S. Doermann. Structural compression for document analysis. In *Proceedings of the International Conference on Pattern Recognition*, pages 664–668, 1996.
KEY: kia96
CATEGORIES: COMPRESSION
- [314] O.E. Kia and D.S. Doermann. Structure-preserving document image compression. In *Proceedings of the International Conference on Image Processing*, pages 193–196, 1996.
KEY: kia96a
CATEGORIES: COMPRESSION
- [315] Q. Zhang and J.M. Danskin. Entropy-based template matching for document image compression. In *Proceedings of the International Conference on Image Processing*, pages 221–224, 1996.
KEY: zhang96b
CATEGORIES: COMPRESSION

12.2 Halftoning

- [316] L. Akarun, D. Ozdemir, and O. Yalcin. Joint quantization and dithering of color images. In *Proceedings of the International Conference on Image Processing*, pages 557–560, 1996.
KEY: akarun96
CATEGORIES: HALFTONING
- [317] T. Asano. Digital halftoning algorithm based on random space-filling curve. In *Proceedings of the International Conference on Image Processing*, pages 545–548, 1996.
KEY: asano96
CATEGORIES: HALFTONING
- [318] J.R. Goldschneider, E.A. Riskin, and P.W. Wong. Embedded color error diffusion. In *Proceedings of the International Conference on Image Processing*, pages 565–568, 1996.
KEY: goldschneider96
CATEGORIES: HALFTONING
- [319] H. Lee, Y. Yoo, and H. Park. Digital halftoning algorithm using visual-optimized binary patterns. In *Proceedings of the International Conference on Image Processing*, pages 541–544, 1996.
KEY: lee96h
CATEGORIES: HALFTONING
- [320] J. Liu and F. Cheng. Color halftoning: a non-separable model. In *Proceedings of the International Conference on Image Processing*, pages 561–564, 1996.
KEY: liu96d
CATEGORIES: HALFTONING
- [321] V. Ostromoukhov, P. Emmel, N. Rudaz, I. Amidror, and R.D. Hersch. Dithering algorithms for variable dot size printers. In *Proceedings of the International Conference on Image Processing*, pages 553–556, 1996.
KEY: ostromoukhov96
CATEGORIES: HALFTONING
- [322] K. O'Regan, N. Bismuth, R. Hersch, and A. Pappas. Legibility of perceptually-tuned grayscale fonts. In *Proceedings of the International Conference on Image Processing*, pages 537–540, 1996.
KEY: regan96
CATEGORIES: HALFTONING, FONT
- [323] Z. Xiong, M.T. Orchard, and K. Ramchandran. Inverse halftoning using wavelets. In *Proceedings of the International Conference on Image Processing*, pages 569–572, 1996.
KEY: xiong96
CATEGORIES: HALFTONING

12.3 Synthetic Data

- [324] T. Kanungo and R.M. Haralick. Automatic generation of character groundtruth for scanned documents: A closed-loop approach. In *Proceedings of the International Conference on Pattern Recognition*, pages 669–675, 1996.
KEY: kanungo96
CATEGORIES: SYNTHETIC
- [325] R. P. Rogers, I. T. Phillips, and R. M. Haralick. Semiautomatic production of highly accurate word bounding box ground truth. In *Proceedings of the International Workshop on Document Analysis Systems*, pages 375–387, 1996.
KEY: rogers96
CATEGORIES: SYNTHETIC, WORD

12.4 Databases

- [326] J. W. Chen and S. Y. Lee. A hierarchical representation for the reference database of on-line Chinese character recognition. In *Proceedings of the Workshop on Structural and Syntactic Pattern Recognition*, 1996.
KEY: chen96g
CATEGORIES: DATABASES, TEXT PROCESSING, ONLINE, FOREIGN LANGUAGE, CHINESE

12.5 Font Processing

- [327] S. Khoubyari and J. J. Hull. Font and function word identification in document recognition. *Computer Vision and Image Understanding*, 63(1):66–74, 1996.
KEY: khoubyari96
CATEGORIES: FONT, WORD

12.6 Machine Translation

12.7 Music Recognition

- [328] K. C. Ng and R. D. Boyle. Recognition and reconstruction of primitives in music scores. *Image and Vision Computing*, 14(1):39–46, 1996.
KEY: ng96
CATEGORIES: MUSIC
- [329] K.T. Reed and J.R. Parker. Automatic computer recognition of printed music. In *Proceedings of the International Conference on Pattern Recognition*, pages 803–807, 1996.
KEY: reed96
CATEGORIES: MUSIC

12.8 Shorthand

12.9 Natural Scenes

- [330] J. Heikkonen and M. Mantynen. A computer vision approach to digit recognition on pulp bales. *Pattern Recognition Letters*, 17(4):413–420, 1996.
KEY: heikkonen96
CATEGORIES: NATURE, TEXT PROCESSING, OCR, DIGIT
- [331] T. M. Jorgensen, S. S. Christensen, and A. W. Andersen. Detecting danger labels with ram-based neural networks. *Pattern Recognition Letters*, 17(4):399–412, 1996.
KEY: jorgensen96
CATEGORIES: NATURE, APPLICATION, LOGO, NEURAL NET

- [332] S.K. Kim, D.W. Kim, and H.J. Kim. A recognition of vehicle license plate using a genetic algorithm based segmentation. In *Proceedings of the International Conference on Image Processing*, pages 661–664, 1996.
KEY: kim96g
CATEGORIES: NATURE
- [333] G. Piccioli, E. De Micheli, P. Parodi, and M. Campani. Robust method for road sign detection and recognition. *Image and Vision Computing*, 14(3):209–254, 1996.
KEY: piccioli96
CATEGORIES: NATURE
- [334] C. Rauber, P. Tschudin, S. Startchik, and T. Pun. Archival and retrieval of historical watermark images. In *Proceedings of the International Conference on Image Processing*, pages 773–776, 1996.
KEY: rauber96
CATEGORIES: NATURE
- [335] L. L. Winger, M. E. Jemigan, and J.A. Robinson. Character segmentation and thresholding in low-contrast scene images. In *Proceedings of the SPIE - Document Recognition III*, pages 286–296, 1996.
KEY: winger96
CATEGORIES: NATURE, CHARACTER SEGMENTATION

12.10 Information Retrieval

- [336] C. H. Lin and H. Chen. An automatic indexing and neural network approach to concept retrieval and classification of multilingual (Chinese-english) documents. *IEEE Transactions on Systems, Man and Cybernetics*, 26(1):75–88, 1996.
KEY: lin96a
CATEGORIES: INFORMATION RETRIEVAL, NEURAL NET
- [337] E. Mittendorf and P. Schauble. Measuring the effects of data corruption on information retrieval. In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, pages 179–190, 1996.
KEY: mittendorf96
CATEGORIES: INFORMATION RETRIEVAL, POSTPROCESSING, EVALUATION
- [338] A. Takasu, N. Katayama, M. Yamaoka, O. Iwaki, K. Oyama, and J. Adachi. Approximate matching for OCR-processed bibliographic data. In *Proceedings of the International Conference on Pattern Recognition*, pages 175–179, 1996.
KEY: takasu96
CATEGORIES: INFORMATION RETRIEVAL

12.11 Hardware

13 Miscellaneous